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DRAFT FINAL SITE INSPECTION WORK PLAN, PRELIMINARY ASSESSMENT, OTHER AREAS/UTILITIES, VOLUME 1 OF 3 - UNDERGROUND UTILITIES

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HARDING LAWSON ASSOCIATES

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1.0 INTRODUCTION

This work plan has been developed by Harding Lawson Associates (HLA) under contract to PRC Environmental Management, Inc. (PRC), on behalf of the Department of the Navy (Navy), Western Division (WESTDIV), Naval Facilities Engineering Command. The plan was prepared under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract No. N62474-88-D-5086, Contract Task Order 140.

The Site Inspection Work Plan comprises three volumes that address all sites identified in the PA Other Areas/Utilities report (*HLA, 1990c*) as requiring site inspections (SIs). Volume I addresses the Underground Utilities (Preliminary Assessment [PA] Sites PA-45 through PA-50), Volume II addresses sites with previous analytical data (PA-19, PA-24, PA-32, PA-36, and PA-39), and Volume III addresses sites with no previous analytical data (PA-23, PA-25 through PA-31, PA-33 through PA-35, PA-37, PA-38, PA-40 through PA-44, and PA-51 through PA-58).

This plan is Volume I and describes the objectives, technical approach, and implementation procedures for the SIs of the underground utilities at the Naval Station, Treasure Island, Hunters Point Annex (HPA), San Francisco, California (Plate 1). These utilities consist of the steamlines (PA-45), the fuel distribution lines associated with the Tank Farm (PA-46), the fuel distribution lines associated with Tank S-505 (PA-47), the suspected steamlines near former Building 503 (PA-48), the fuel distribution lines associated with Buildings 203 and 205 (PA-49), and the storm drains and sanitary sewers (PA-50). The steamlines (PA-45) and the storm drains and sanitary sewers (PA-50) occur throughout the facility and are not shown on Plate 1. The locations are shown on plates presented in later sections.

This work plan is organized in five sections. Section 1.0 presents the development of Operable Units for the facility, the site inspection program for the underground utilities, the rationale for inclusion of the utilities in the SI program, and the hydrogeologic setting at HPA. Section 2.0 describes the sampling approach and site-specific sampling programs for PA-45 through PA-50. Section 3.0 describes the field procedures to be used during the SI program. Section 4.0 presents a schedule for implementing the SIs.

1.1 Background

1.1.1 Development of Operable Units (OUs)

RI activities are currently proposed or being conducted at 18 sites within HPA as part of the Navy's Installation Restoration (IR) program. The IR sites are currently grouped into five Operable Units (OUs) as follows:

Operable Unit	IR Sites
OU I	IR-1/IR-21, IR-2, IR-3
OU II	IR-6, IR-8, IR-9, IR-10
OU III	IR-4, IR-5
OU IV	IR-7
OU V	IR-11, IR-12, IR-13, IR-14, IR-15, IR-17 IR-20, IR-22

Operable Unit V also contains two PA sites (PA-16 and PA-18) that have been investigated in the SI program (*HLA, 1991c*) and 37 other PA sites for which the three work plans mentioned above, including this one, have been prepared. In addition, a work plan for Sites IR-20 and IR-22 was recently prepared (*HLA, 1991d*). These sites are included in OU V.

1.1.2 Development of the Site Inspection Program for the Underground Utilities

As a result of the preliminary investigation described in the PA Other Areas/Utilities report (*HLA, 1990c*), six underground utility sites were assessed as needing site inspections:

PA-45	Steamlines
PA-46	Chemical Distribution Lines, Tank Farm
PA-47	Chemical Distribution Lines, Tank S-505
PA-48	Chemical Distribution Lines, Former Building 503
PA-49	Chemical Distribution Lines, Buildings 203 and 205
PA-50	Storm Drains and Sanitary Sewer Lines.

On the basis of HPA facility maps reviewed during preparation of this SI Work Plan, general modifications to the site definitions are proposed. The HPA maps show that only fuel and oil distribution lines exist at the Tank Farm (PA-46), Tank S-505 (PA-47) and Building 205 (PA-49). Therefore, these lines are referred to as fuel distribution lines in this work plan. The chemical distribution lines near former Building 503 are suspected steamlines and are referred to as suspected steamlines in this work plan.

The revised site descriptions for the underground utilities are as follows:

PA-45	Steamlines
PA-46	Fuel Distribution Lines, Tank Farm
PA-47	Fuel Distribution Lines, Tank S-505
PA-48	Suspected Steamlines, Former Building 503
PA-49	Fuel Distribution Lines, Buildings 205 and 203
PA-50	Storm Drain and Sanitary Sewer Lines

1.1.3 Rationale for Inclusion in SI Program

This section briefly describes the rationale for inclusion of each utility in the SI program. A detailed background description of each utility is included in Section 2.0.

1.1.3.1 Steamlines (PA-45)

The steamlines were included in the SI program because it is suspected that Triple A Machine Shop (Triple A) may have used them to transport waste oil containing polychlorinated biphenyls (PCBs) (*SFDA, 1986*), which could potentially be released to the environment.

1.1.3.2 Fuel Distribution Lines: Tank Farm, Tank S-505, and Buildings 203 and 205 (PA-46, PA-47, PA-49)

The fuel distribution lines were included in the SI program because the physical integrity and the contents of the lines have not been evaluated. If the integrity of the fuel distribution lines has been compromised, fuel could be released to the environment.

1.1.3.3 Suspected Steamlines: Former Building 503 (PA-48)

The suspected steamlines near former Building 503 were included in the SI program in response to comments received from the United States Environmental Protection Agency (EPA) (*EPA, 1991*) suggesting that a utility line ran from Berth 15 along Manseau Street to Hussey Street, then south to H Street, and continued on to the vicinity of Building 521. The EPA also suggested that the line was used to transport waste oils and may have broken near Building 503, resulting in a spill. No evidence of a steam line running along Hussey Street has been found on any HPA facility maps. The area is included to determine whether a steamline is present along Hussey Street, and, if a line is located, to assess whether a release to the environment has occurred.

1.1.3.4 Storm Drain and Sanitary Sewer Systems (PA-50)

The storm drain and sanitary sewer systems are included because the lines were previously used for the disposal of hazardous materials (*HLA, 1990c*). In addition,

laboratory analysis of sediments collected during the stormwater investigation (*HLA, 1991b*) detected the presence of various volatile organic compounds (VOCs), semivolatile organic compounds (SOCs), metals, PCBs, and petroleum hydrocarbons. The storm drain and sanitary sewer systems are included in the SI program because of the potential for release of contaminants to soil or groundwater through breaks or leaks in the systems.

1.2 Geology and Hydrogeology of HPA

Five geologic units underlie HPA, the oldest of which is bedrock of the Franciscan Formation. The bedrock is overlain in some low-lying areas by undifferentiated sedimentary deposits of sands and clays, which are in turn overlain by a relatively extensive layer of Bay mud deposits consisting of soft, organic, plastic clay and silt with interbedded lenses of sand and peat. In some areas of HPA, the Bay mud deposits are overlain by poorly graded sands and silty sands designated as the undifferentiated upper sand (*HLA, 1991a*). These sands may be native or hydraulically deposited. In most areas of HPA, artificial fill has been placed over one or more of these units. This artificial fill consists of two types of material: (1) bedrock-derived fill from upland areas at HPA, and (2) industrial fill consisting of sandblast materials, industrial waste including construction debris, and some domestic waste.

To date, two aquifer zones have been defined at HPA, the uppermost aquifer zone (A aquifer) and the undifferentiated aquifer zone (B aquifer). The A aquifer is defined as saturated fill materials and undifferentiated upper sand deposits that overlie the bay mud deposits. The A aquifer is generally unconfined to semiconfined with depths to groundwater ranging from 2 to 12 feet below ground surface (bgs). The B aquifer, the undifferentiated aquifer zone, consists of undifferentiated sedimentary

deposits underlying the bay mud deposits above the Franciscan bedrock. Only limited data on the undifferentiated aquifer zone are currently available.

These two aquifer zones are separated by the bay mud deposits over the majority of the site but may be in direct connection in areas where the bay mud is absent. The bay mud deposits, which range from less than 5 to approximately 60 feet in thickness, act as an aquitard between the two aquifer zones.

Groundwater flow directions at HPA are not well understood. Local groundwater flow directions may be quite complex because of heterogeneity in the hydraulic properties of subsurface fill materials, tidal influences, influences of the sanitary sewer systems, and variations in topography. In some areas, local groundwater flow directions have been observed to vary temporally with tidal fluctuation and localized groundwater recharge from storm events.

2.0 SAMPLING PROGRAM

2.1 Objectives

The primary objective of the SI for each of the underground utilities is to gather data to evaluate whether contaminants have been released from the utilities to the surrounding soil, or groundwater, or San Francisco Bay. In addition to this primary objective, the presence of potential contaminants within the utilities will be evaluated because such contaminants could become a concern in the future; information will also be collected that can be used for preparation of utility removal action plans, if appropriate.

2.2 Sampling Approaches

The SI Work Plan consists of a series of tasks specific to each utility. The first set of tasks is reconnaissance-oriented and consists of site inspections and geophysical work to verify line locations. Generally, sampling of the material inside the lines will be performed next. The results of the sampling tasks will then be evaluated to delineate areas within the lines that are contaminated and that will require further investigation to evaluate the integrity of the lines. A suitable technique for evaluating the integrity of the lines (e.g., pressure testing, video survey, or tracer gas methods) will be selected after the two tasks described above are completed. If lines are found to be in poor condition in contaminated areas, trenching or drilling will be performed to evaluate whether a release has occurred. Trenching and boring data will be used in conjunction with existing data from borings and wells already drilled adjacent to utilities.

2.3 Site Sampling Plans

2.3.1 Steamlines (PA-45)

2.3.1.1 Background

Steamlines were used to distribute steam throughout the HPA facility, but are no longer in use. On the basis of review of Navy records, portions of the steamlines may have been abandoned in 1969, while other portions of the lines may not have been abandoned until after 1984. The steamline system is shown on Plates 2 and 3. All of the lines are covered with asbestos-containing pipe lagging and located within concrete-lined pipeline trenches that vary in size, but in general are approximately 3 feet wide and 2 feet deep. The condition of the asbestos pipe insulation varies; it has been stripped away in some locations. The pipeline trenches are equipped with inspection holes (access holes) which vary in length from 3 to 12 feet.

A portion of the steamline system was allegedly used by Triple A to transport waste oils containing PCBs from Drydock 4, Building 521, and Berth 29 to Tank S-505 (*SFDA, 1987*) (Plate 2). An access hole containing oil was observed by HLA in the area between Drydock 4 and Berth 14 (Plate 2).

The steamline in the vicinity of Buildings 502 and 503 (Plate 2) was broken during construction activities in the early 1980s, resulting in a spill of an undetermined quantity of oil. The spill was reportedly cleaned up and the lines repaired. Documentation and/or laboratory analytical results for soil samples collected in the vicinity of the break were not available to confirm the adequacy of the oil cleanup (*HLA, 1990c*).

HLA sampled the steamline contents (oil) in 1987 (*HLA, 1987*). Sample SP-STM-1 was collected at the South Pier from the location shown on Plate 2. The sample was analyzed for PCBs, total petroleum hydrocarbons (TPH) as gasoline,

TPH as kerosene, TPH as fuel oil, and metals. PCBs were not detected in the sample. Analysis for TPH detected 6 to 7 percent gasoline and 33 percent fuel oil. Heavier oil and grease not quantifiable by the analytical method used were also identified. Barium, vanadium, nickel, and zinc were also detected in the sample. The analytical results are summarized in Table 1.

On November 8, 1989, HLA personnel inspected the portion of the steamline system that reportedly contains waste oil. The inspection included walking the length of the steamline and inspecting each access hole for visible indications of contamination. A dark oily substance was observed floating on the liquid (water) at the steamline access hole at the intersection of Morrell and Manseau streets. An oily odor was noted in the cut end of an exposed steam pipe in the steamline trench at the west end of former Building 503 along H Street (*HLA, 1990c*).

On October 8, 1991, HLA personnel inspected several access holes near the SubBase area and Tank Farm (Plate 3). The steamlines appear to have been cut and cap welded in some locations. A fuel odor was detected in all access holes in both areas.

On October 10, 1991, HLA personnel inspected the steamlines in the vicinity of former Building 503. The inspection included walking along the steamline and inspecting each access hole or area of exposed pipe. In several access holes, the line had been cut and the ends left open. Near former Building 503, three portions of pipe are exposed. One portion appears to be the expansion joint. This pipe appears to have been cut and contains black waste oil (Plate 2). In other vaults near former Building 503, the steamlines appear to be in good condition. No fuel odors were detected in the vaults.

On October 21, 1991, several access holes at the South Pier were inspected. The steamlines appeared to be in good condition. Two access holes near the intersection of Morrell and Manseau streets (Plate 2) were flooded with water which had a slight sheen.

Fuel odors were also detected in both vaults. One access hole appears to have been the same access hole inspected during the 1989 inspection.

The available data indicate that the steamlines may have been used to transport waste oils, and that portions of the steamlines may still contain waste oil. The extent of waste oil contamination within the steamlines is not well documented and should be investigated.

2.3.1.2 Sampling Plan

The proposed investigation of the steamlines consists of four chronologically arranged tasks. Depending on the results of Tasks 1 through 3, the scope of Task 4 may be modified.

- **Task 1 - Preparation of a Detailed Steamline Map**: Preparation of a detailed map will consist of a review of existing HPA facility maps, inspection of the steamlines at the access vaults to verify the location, size, and number of lines shown on the map, and, if possible, mapping areas where the steamlines appear to be abandoned in place.

- **Task 2 - Inspection and Sampling of the Steamlines**: Inspection and sampling of the steamlines will include the development of an approach for accessing the steamlines to visually inspect the inside of the steamlines for the presence of waste oil, and to sample any waste oil present. The plan for accessing the steamlines will also include development of a contingency plan and a spill prevention plan. After a plan for accessing the lines is developed, the insides of the lines will be visually inspected and sampled. Proposed locations are shown on Plates 2 and 3. A minimum of one sample will be collected at each sampling location that contains fluid. If more than one type of fluid is encountered, one sample of each fluid will be collected. The proposed sampling locations may be modified after completion of Task 1. Approximately 23 oil samples are expected to be collected. The results of Task 2 will be used to map the distribution of waste oils inside the steamlines.

- **Task 3 - Inspection of the Steamlines Where Waste Oil is Present Inside the Lines**: In areas where waste oil is present, the steamlines will be visually inspected at pipeline-trench access points for the presence of waste oils within the vaults. If waste oils are discovered in the pipeline-trenches, the integrity of the steamlines will be checked. The method for evaluation of the integrity of the lines will be developed after completion of Tasks 1 and 2.

- **Task 4 - Trenching Along Steamline Pipeline-Trenches:** In areas where releases of waste oils from the pipelines to the vaults have occurred, trenches will be dug along the pipeline trenches. Trenching will allow for inspection of the condition of the pipeline trenches, and for sampling of the soil surrounding the pipeline trench to evaluate the soil chemistry. A minimum of one sample will be collected from each trench.

The data collected during the site investigation will be used to verify releases from the steamlines to the environment.

The rationale for the proposed tasks is summarized in Table 2. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA Quality Assurance Project Plan (QAPjP) (*HLA, 1988b*).

2.3.1.3 Analytical Program

Because it is suspected that the steamlines were used to transport waste oil containing PCBs, all oil samples collected during Task 2 and soil samples collected during Task 4 and submitted to the chemical laboratory will be analyzed for the following parameters:

- Contract Laboratory Program (CLP) VOCs;
- CLP SOCs;
- CLP PCBs/Pesticides;
- Priority Pollutant Metals plus barium, cobalt, molybdenum, and vanadium using CLP methods;
- TPH as Diesel and Gasoline;
- Total Recoverable Petroleum Hydrocarbons;
- pH; and
- Asbestos.

All analyses will be performed by a laboratory certified by the State of California and the U.S. EPA for CLP analyses and by the Navy (through the Naval Energy and Environmental Support Activity [NEESA]) for the analyses requested. The

estimated number of samples to be analyzed, the sample media, and analytical methods to be used are summarized in Table 3.

2.3.2 Fuel Distribution Lines: Tank Farm (PA-46)

2.3.2.1 Background

Review of HPA facility maps indicates that four pipelines originating from the Tank Farm were used to transport diesel fuel to Berths 55 and 56 and both diesel fuel and lube oil to Berths 57, 58, and an abandoned pier, Berth 60 (Plate 4). Pipelines were also used to transport waste diesel fuel and waste lube oil from the berths back to the Tank Farm. The term "fuel distribution lines" used throughout this section refers to the four pipelines used to transport both clean diesel fuel and lube oil and waste diesel fuel and lube oil. According to the facility maps, the new and waste lube oil lines were 3-inch lines and the new and waste diesel fuel lines were 4-inch lines. Plate 4 shows the approximate locations of the fuel distribution lines. HPA facility maps indicate that the branch of the lines that ran from Berths 57 and 58 to Berth 60 was abandoned prior to 1972. The lines that run from the Tank Farm to Berths 55 and 56 were never abandoned, but are no longer in use. Facility maps also indicate that the lube oil lines were abandoned in 1960. The methods of abandonment are not documented. It is anticipated that fuel lines within the bermed area of the Tank Farm will be removed during removal actions at the Tank Farm (*HLA, 1990b*).

On October 8, 1991, HLA personnel inspected several access holes along the approximate location of the fuel lines. The results of the inspection are summarized as follows:

- Fuel odors were detected in the majority of the pipeline trenches accessed;

- Dark staining was observed along a 4-inch line at a subsided area at Berth 62. Because of this staining, the investigation of the suspected fuel lines will be extended to Berth 62 (Plate 4);

- The lines are no longer labeled; most of the pipes are rusted and in very poor condition;

- Because the lines are not labeled and are in poor condition, it is difficult to separate diesel fuel lines or lube oil lines from other utility lines including saltwater, freshwater, steam, and condensate lines that run parallel to the fuel lines;

- It appears that the fuel lines are in concrete pipeline trenches in some locations and are buried in the soil in other locations; and

- Two fuel lines were positively identified near Building 134. The condition of the lines was poor. During line inspection, a small break in the pipe occurred. The fluid which leaked appeared to be diesel fuel. The leak was subsequently plugged; the leaking fluid was contained and placed in a 55-gallon drum. The leak indicates that fuel is still present in some of the fuel distribution lines.

Currently available data indicate the fuel lines are still in place, that they may be in poor condition, and that at least one line still contains fuel. On the basis of the inspection, it appears that it is not possible to positively identify the lines by visual inspection at access holes.

2.3.2.2 Sampling Plan

The investigation of the fuel lines originating from the Tank Farm will consist of the following chronologically arranged tasks. The tasks are designed to collect data necessary for development of removal action plans for the fuel lines.

- **Task 1 - Geophysical Survey:** Geophysical techniques will be used to trace the location of the four suspected pipelines from the Tank Farm to the berths which they supplied. The results of the survey will be used to update the fuel line map (Plate 4) and to modify the proposed locations of Task 2 activities, if appropriate.

- **Task 2 - Trenching:** Trenches will be dug at locations where leakage from the fuel lines would be most likely to occur, including most, but not all, pipe bends and junctions. Plate 4 shows the proposed trenching locations. Trenching will allow for inspection of the condition of the line, verification of line location and depth, and for soil sampling to evaluate soil chemistry near the fuel lines. Trenches will be excavated to

the water table unless visual evidence of contamination is found above the water table. A minimum of one soil sample will be collected from each trench. If fluids are encountered during trenching, samples of the fluids will be collected and analyzed for the same constituents as the soil samples.

The data collected during the SI may be used to develop a removal action plan for the fuel lines. Removal of the fuel lines will prevent possible releases to the environment in the future. Additional visual inspections and sampling of the soil surrounding the fuel lines may be recommended as part of the removal action to further evaluate the nature and extent of any releases to the environment which may have occurred from the fuel lines.

The rationale for the proposed tasks is summarized in Table 4. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.2.3 Analytical Program

Because both clean and dirty diesel oil and new and used lube oil were transported through the fuel distribution lines, soil samples collected during the trenching activities and submitted to the chemical laboratory will be analyzed for the following parameters:

- CLP VOCs;
- CLP SOCs;
- CLP PCB/Pesticides;
- Priority Pollutant Metals, plus barium, cobalt, molybdenum, and vanadium using CLP methods;
- TPH as Diesel and Gasoline;
- Total Recoverable Hydrocarbons; and
- pH.

All analyses will be performed by a laboratory certified by the State of California and the U.S. EPA for CLP analyses and by the Navy (through NEESA) for the analyses requested. Approximately 13 soil samples will be analyzed using the analytical methods summarized in Table 3.

2.3.3 Fuel Distribution Lines: Tank S-505 (PA-47)

2.3.3.1 Background

Several lines associated with Tank S-505 are shown on the HPA facility maps. These pipelines include an 8-inch line between Tank S-505 and the Fuel Oil Receiving Station at Berth 29, an 8-inch line between Tank S-505 and the Oil Reclamation Ponds (IR-3), a 4-inch line between Tank S-505 and the storage tanks on the west side of Building 521, a 6-inch line from the storage tanks into Building 521, and a 2 1/2-inch line from Building 521 to the storage tanks. The approximate locations of the fuel lines are shown on Plate 5. It is anticipated that fuel lines within the bermed area of Tank S-505 will be removed during the removal actions for Tank S-505 (*HLA, 1990a*).

The pipelines were used to transport diesel fuel from the receiving station at Berth 29 to Tank S-505 used for storage of fuel for the power plant (Building 521). According to the Initial Site Assessment (IAS) (*Westec, 1984*), oily wastes were also transported through a pipeline from Berth 29 to the Oil Reclamation Ponds. It has also been alleged that Triple A used Tank S-505 for storage of waste oils pumped from ships under repair at the base. It is not known whether the pipelines were used by Triple A to transport waste oils to Tank S-505.

On October 21, 1991, HLA personnel inspected several access holes along the approximate location of the fuel lines and walked the area of the 8-inch line that ran from Tank S-505 to the Oil Reclamation Ponds to look for access to the line. No evidence of the fuel lines was found in the holes accessed. In addition, no access holes

were found on the walk from Tank S-505 to the Oil Reclamation Ponds. A line approximately 8 inches in diameter that was cut, capped, and apparently abandoned was discovered during the site walk (Plate 5); however, it is not known whether the line was part of the fuel line.

The fuel lines were used to transport both fuel oil and waste oil during base operations; therefore, release of both fuel oil and waste oils could have occurred. The site walk performed by HLA indicated that the lines may have been abandoned or removed. Because data on the condition of the lines are not available and because of the possibility that a release may have occurred in the past or may occur in the future, an investigation of the fuel lines is necessary.

2.3.3.2 Sampling Plan

The investigation of the fuel lines associated with Tank S-505 will consist of the following tasks performed in the order presented below.

- **Task 1 - Geophysical Survey:** Geophysical techniques will be used to trace the location of the suspected pipelines between Berth 29 and Tank S-505, between Tank S-505 and the Oil Reclamation Ponds, and between Building 521 and Tank S-505. The results of the survey will be used to update the fuel line map (Plate 5) and modify the proposed locations of the Task 2 activities, if necessary.

- **Task 2 - Trenching:** Trenches will be dug at locations where leakage from the fuel lines would be most likely to occur. Proposed trench locations include most pipe junctions and bends (Plate 5). Trenching will allow for inspection of the condition of the line, verification of the line location and depth, and for sampling of the soil to evaluate soil chemistry near the fuel lines. One soil sample will be collected from each trench location. If fluids are encountered during trenching, samples of the fluids will be collected and analyzed for the same constituents as the soil samples.

The tasks are designed to collect data necessary for development of removal action plans for the lines. Additional visual inspections and sampling of the soil

surrounding the fuel lines may be recommended as part of the removal action to further evaluate whether releases to the environment occurred.

The rationale for the proposed tasks is presented in Table 5. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.3.3 Analytical Program

Because the pipelines were used to transport waste oil to the Oil Reclamation Ponds, soil samples collected during the trenching activities and submitted to the chemical laboratory will be analyzed for the following parameters:

- CLP VOCs;
- CLP SOCs;
- CLP PCB/Pesticides;
- Priority Pollutant Metals plus barium, cobalt, molybdenum and vanadium, using CLP methods;
- TPH as Diesel and Gasoline;
- Total Recoverable Petroleum Hydrocarbons; and
- pH.

All analyses will be performed by a laboratory certified by the State of California and the U.S. EPA for CLP analyses and the Navy (through NEESA) for the analyses requested. Approximately 6 soil samples will be analyzed using the analytical methods summarized in Table 3.

2.3.4 Suspected Steamlines: Building 503 (PA-48)

2.3.4.1 Background

The suspected steamlines near former Building 503 are not shown on any HPA facility maps. However, the lines were reported to exist by the EPA (*EPA, 1991*) and

are referenced in the PA Other Areas/Utilities report (*HLA, 1990c*). The suspected steamlines are reported to have originated at the northwest corner of Berth 15 and to have run along Manseau Street to Hussey Street, then 350 feet along the west side of Hussey Street, west to H Street, and finally south along H Street to the vicinity of the Power Plant. It was also suggested by the EPA and in the PA Other Areas/Utilities report (*HLA, 1990c*) that these lines may have contained PCB oils and may have been broken and abandoned in place. The approximate location of the suspected steamlines is shown on Plate 6.

Because of the possibility that the lines may exist and may contain PCB oils, this site was included as PA-48.

2.3.4.2 Sampling Plan

The investigation of the suspected steamlines will consist of the following tasks.

- **Task 1 - Geophysical Survey:** Geophysical techniques will be used to attempt to locate the suspected pipeline. Both the west and east sides of Hussey Street and the north and south sides of Manseau Street will be investigated. If the pipeline is located it will be mapped using geophysical techniques and Task 2 will be conducted. If the pipeline is not located, no further investigation along Hussey Street is recommended. The west side of Building 503 will be investigated as part of the steamline (PA-45) investigation.

- **Task 2 - Trenching:** If the pipeline is located, trenches will be dug at locations where leakage from the pipelines would most likely occur, including most pipe junctions and bends. Trenching will allow for verification of the line location and depth, inspection of the condition of the line, and sampling of the soil to evaluate soil chemistry near the pipe lines. Trenching locations will be selected after the location of the pipeline is verified. One soil sample will be collected from each trench. If fluids are encountered during trenching, samples of the fluids will be collected and analyzed for the same constituents as the soil samples.

If a pipeline is located along the suspected pipeline alignment, the data collected during the SI may be used to prepare a removal action plan.

The rationale for the proposed tasks is presented in Table 6. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.4.3 Analytical Program

If the pipeline is located and Task 2 is implemented, the following analytical program will be implemented. Because the history of usage of the pipeline is not known, soil samples collected during the trenching activities will be analyzed for the following parameters:

- CLP VOCs;
- CLP SOCs;
- CLP PCBs/Pesticides;
- Priority Pollutant Metals plus barium, cobalt, molybdenum and vanadium, using CLP methods;
- TPH as Diesel and Gasoline;
- Total Recoverable Petroleum Hydrocarbons; and
- pH.

All analyses will be performed by a laboratory certified by the State of California and the U.S. EPA for CLP analyses and by the Navy (through NEESA) for the analyses requested. Because it is unknown whether this pipeline exists, the number of samples to be analyzed was not estimated. Analytical methods that would be used are the same as those shown above.

2.3.5 Fuel Distribution Lines: Buildings 205 and 203 (PA-49)

2.3.5.1 Background

Review of HPA facility maps indicates a set of pipelines in the area of Building 205. Facility control diagrams indicate that the lines run between the docks

near Buildings 204 and 205 around Drydock 2 and along the shore from Berth 1 to Berth 2. Building 205 was operated as a boiler house for steam generation and as a pumphouse for the drydocks. One tank (S-214) was located between Buildings 204 and 205 and was used to store fuel for the boiler units in Building 205 (*PRC, 1991*). The locations of the tank and suspected fuel distribution lines are shown on Plate 7. According to facility maps, the fuel lines may have been abandoned. However, the method of abandonment is not documented. On the basis of review of facility maps it appears that the fuel lines parallel the steamlines in this area. This will be investigated further during Task 1. The tank is being investigated as part of the Underground Storage Tank program. Only the pipelines are being investigated as part of the SI.

Review of HPA facility maps also indicates that fuel distribution pipelines run between Berth 4, Building 203, and Underground Storage Tank S-209. Building 203 was used as a boiler room for steam generation and was still in use as late as 1984 (*SFDA, 1986*). Tank S-209 was used for storage of fuel oil for Building 203 and as an emergency oil dumping facility (*PRC, 1991*). Berth 4 was used as a fuel receiving station. The suspected location of the pipeline is shown on Plate 8. A 14,000 gallon Underground Brine Storage Tank is also shown on Plate 8. The Underground Brine Storage Tank and Tank S-209 are being removed as part of the Underground Storage Tank program (*PRC, 1991*). Piping from Tank S-209 to Building 203 was removed during tank closure operations. According to facility maps, the fuel lines between Building 203 and Berth 4 may have been abandoned; however, the method of abandonment is not documented.

Neither the integrity nor contents of the fuel distribution lines have been evaluated during previous studies. The fuel lines have been included in the SI and will be studied as described below.

2.3.5.2 Sampling Plan

The investigation of the fuel lines that originate from Buildings 203 and 205 will consist of the following tasks. The tasks are designed to collect data necessary for development of removal action plans.

- **Task 1 - Geophysical Survey:** Geophysical techniques will be used to trace the locations of the suspected pipelines between the buildings and the berths. The results of the surveys will be used to update the fuel line map (Plates 7 and 8), and modify proposed locations for Task 2 activities, if necessary.

- **Task 2 - Trenching:** Trenches will be dug at locations where leakage from the fuel lines would most likely occur, including most pipe junctions and bends. Plates 7 and 8 show the proposed trenching locations. Trenching will allow inspection of the condition of the line, verification of the line location and depth, and for sampling of the soil to evaluate soil chemistry near the fuel lines. A minimum of one soil sample will be collected from each trench. If fluids are encountered during trenching, samples of the fluids will be collected and analyzed for the same constituents as the soil samples.

The data collected during the SI may be used to write a removal action plan for the fuel lines. Additional visual inspections and sampling of the soil surrounding the fuel lines may be recommended as part of the removal action to further evaluate whether releases to the environment have occurred from the fuel lines.

The rationale for the proposed tasks is presented in Table 7. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.5.3 Analytical Program

Because use of the fuel lines is not well documented, soil samples collected during the trenching activities and submitted to the chemical laboratory will be analyzed for the following parameters:

- CLP VOCs;
- CLP SOCs;

- CLP PCBs/Pesticides;
- Priority Pollutant Metals plus barium, cobalt, molybdenum, and vanadium using CLP methods;
- TPH as Diesel and Gasoline;
- Total Recoverable Petroleum Hydrocarbons; and
- pH.

All analyses will be performed by a laboratory certified by the state of California and the U.S. EPA for CLP analyses and by the Navy (through NEESA) for the analyses requested. Approximately 13 soil samples will be analyzed, using the analytical methods summarized in Table 3.

2.3.6 Storm Drain and Sanitary Sewer Lines (PA-50)

2.3.6.1 Background

HPA is currently served by a sanitary sewer system that collects facility-generated sanitary sewage and conveys it to the City and County of San Francisco's wastewater treatment system. The HPA sanitary system consists of 10 major reaches of pipe (Reaches 1 through 10) (*YEI Engineers, 1988a*). The individual reaches were originally defined to facilitate the engineering hydraulics analysis of the existing system. Reaches 1 through 9 consist of non-interconnected sewer sub-systems that serve discrete portions of the facility. All 9 reaches connect to Reach 10 which both serves a small portion of the facility and acts as the main trunk line for conveying the sewage from the individual reaches to Pump Station "A" and then off the facility to the City of San Francisco Sanitary Sewer System at a manhole on Griffith Street (Plate 9). The system is also presented on four plates (Plates 10 through 13) to facilitate description of the sampling approach.

HPA is currently served by a storm drain system composed of 10 major individual drainage systems, all of which drain directly into San Francisco Bay through

10 outfalls (Plate 14). A Utility Technical Study (UTS) was performed by YEI Engineers in 1988. This study identified 10 individual storm drain systems, designated as Drainage Areas A, B, C, D, E, F, G, H, I, and J (*YEI Engineers, 1988b*). They appear in their entirety on Plate 14 and individually on Plates 15 through 24. In addition to the 10 major drainage systems, piers and near-shore areas are drained by 17 minor drain systems typically consisting of one to four collection portals and a single discharge point. The minor drain systems appear both within and outside of the 10 major drainage system areas. These minor drain systems were not addressed in detail by the YEI engineering study. Flood gates are present within the storm drain system to stop the inflow of corrosive bay water into the storm drain system. "Closed" flood gates do not completely block storm drains; storm water flows over closed flood gates, but sediment may accumulate behind the flood gates.

The UTS was conducted on both the storm and sanitary sewage systems (*YEI, 1988a,b*) to determine system capacity and functionality. The study did not address the environmental quality of the utilities.

The majority of the existing storm drain and sanitary sewer systems were originally constructed from 1942 through 1946 as a combined storm and sanitary sewer system that conveyed stormwater, industrially generated discharge, and sanitary sewage directly to the bay (*YEI Engineers, 1988a, b*).

In 1958, as part of a major upgrade of HPA sewage facilities, segregation of the storm and sanitary sewage systems began. During this separation process, a system was created that collected the sanitary sewage from Drainage Areas C, D, E, F, G, H, I, and J. During the period of 1973 through 1976 the exclusively sanitary sewer system was improved to collect the sanitary sewage in Drainage Areas A and B. The systems were considered to be fully separated in 1976, with all sanitary sewage being conveyed

off the facility to treatment facilities and all stormwater being conveyed to the bay via the storm drain system.

The segregation of the storm drain and sanitary sewer systems consisted of installing new drainage lines and separating portions of the existing combined system into the two respective systems.

The UTS indicates that the existing systems are still interconnected in certain locations. The study also identified tidal flood gates frozen in the closed position that act as barriers retaining sediments and debris that flow through the storm drain system. The UTS indicates that industrial discharges were occurring to both systems.

The sanitary sewer portion of the UTS also indicates that the sanitary system was in "poor" condition. The sanitary sewer collection system appeared to have many sags and dips in the sewer alignments, broken joints, eroded pipe bottoms, infiltration points, damaged manholes and construction deficiencies (*YEI, 1988a*). Although the physical inspection of the existing storm drain system was not as thorough as the inspection of the sanitary sewer system, the UTS assumed that the storm drain system was also in poor physical condition similar to the sanitary sewer system. In addition, the potential impact of the 1989 Loma Prieta Earthquake on the integrity of these systems has not been evaluated.

2.3.6.2 Evaluation of Existing Chemical Data

The Initial Assessment Study (*Westec, 1984*) identified all known industrial wastes produced at HPA and the estimated quantities discharged into the storm drain and sanitary sewer systems. The study specifically identified Drainage Areas A, C, D, E, F, G, and H as being the recipients of industrial discharge.

The PA Other Areas/Utilities Report (*HLA, 1990c*) reviewed existing reports and files and identified storm Drainage Areas A, E, F, and H as requiring further investigation. The regulatory agencies concurred with this finding.

As part of the Storm Water Runoff Investigation (*HLA, 1988c*), chemical analyses of stormwater runoff in storm Drainage Area A were performed that indicated the presence of the PCB Aroclor 1260 and low levels of metals in runoff in this area.

The Water Quality Investigation of Stormwater Drainage (*HLA, 1991b*) described the chemistry of storm drain sediments, stormwater runoff, and pre-storm event storm drain water from Drainage Areas A, D, E, and H. A summary of the chemical results from this investigation are summarized in Tables 8, 9, and 10.

Tables 11 through 20 list all of the areas within HPA identified for environmental investigation, describe past site activities that fall within Storm Drainage Areas A through J, and present the rationale for proposed investigations. These tables represent the 10 existing system drainage areas. Most of the minor drainage areas are within, or near the 10 existing drainage areas, therefore past activities near the minor drainage areas are also represented in Tables 11 through 20. Tables 11 through 20 were compiled from information presented in either the IAS Report (*Westec, 1984*), PA Other Areas/Utilities Report (*HLA, 1990c*), and the IR-1 through IR-11, IR-12 through IR-15 and IR-17 sampling plans (*HLA, 1988d, e, f, g; 1990d*).

On the basis of the activities known to have occurred within the 10 drainage areas, the historical discharge of industrial waste into the combined storm and sanitary sewer system, and the analytical results from samples from 4 of the storm drain locations, all 10 storm drain areas will be included in the investigation.

Because of the poorly documented history of the sanitary sewer system functioning as part of the combined sewer system and because of the UTS observation of industrial discharge, all 10 reaches of the sanitary sewer system will be investigated.

2.3.6.3 Sampling Plan

2.3.6.3.1 Storm Drain System Investigation

The storm drain system investigation will be conducted in a sequence of tasks. The first task will consist of storm drain sediment sampling and chemical analyses to identify areas containing contaminated sediments within the storm drain system. The second task will consist of testing the physical integrity of the system in the contaminated reaches identified during the first task. The third task will consist of investigation of areas adjacent to the system near the locations of compromised physical integrity.

- **Task 1 - Storm Drain Sediment Sampling:** The storm drain system is composed of 10 individual drainage systems and 17 minor systems. Each of the 10 individual drainage systems comprises one to five reaches. The definition of a reach is complicated by often interconnected configurations, ambiguous flow directions, and lack of access near reach junctions. Probable contaminant sources, previous sampling points, and system geometry were considered when defining reaches. Wherever possible, storm drain tidal flood gate structures are defined as the end of a reach to ensure their sampling.

  Proposed storm sewer sediment sample locations are shown on Plates 15 through 24. Samples will be collected at the down drainage ends of reaches as close as possible to but above drainage reach confluences in the 10 major systems and as close to the discharge port as possible in the 17 minor systems. Sediment samples will be assumed to represent the chemistry of the sediments in the system upgradient of the sampling locations to either the end of the reach or to the next sediment sampling location. One sample will be collected from each sample location. It is expected that approximately 10 samples will be collected from drainage Area A, 4 from Area B, 2 from Area C, 3 from Area D, 4 from Area E, 3 from Area F, 3 from Area G, 4 from Area H, 2 from Area I, 1 from Area J, and 1 from each of the 17 minor systems.

  Results of chemical analysis of the storm drain sediments will be interpreted and used to identify portions of the system requiring further

investigation. Portions of the system with contaminated sediments will be assumed to have the potential for release of contaminants to the environment.

- **Task 2 - Drain System Physical Integrity Verification:** The portions of the system identified for further investigation will first be checked for physical integrity. The methods for evaluation of the physical integrity of the system will be developed after completion of Task 1. Appropriate methods may include visual inspection, hydraulic pressure testing, smoke testing, remote video scanning or tracer gas methods.

- **Task 3 - Investigation of Areas Adjacent to System:** If the portions of the system identified as possessing the potential for release of chemicals to the environment are found to be physically sound, no further investigation will occur. If the portions of the system identified as possessing the potential for release are found to have compromised physical integrity, the soil outside of the system near the points of physical compromise will be investigated.

  Depending on locations and conditions of the drain system (e.g., system depth, adjacent structures), areas will be investigated using either drilling or trenching techniques. Soil samples will be collected and submitted for chemical analysis to verify release to the environment. If possible, existing soil and groundwater chemical data generated during previous investigations will be used in the investigation.

The data collected during the SI may be used to develop a removal action plan for the sediment inside the storm drains. Removal of the sediment will prevent possible releases to the environment in the future.

The rationale for the proposed tasks is presented in Table 21. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.6.3.2 Sanitary Sewer System Investigation

The sanitary sewer system will be investigated using the same multi-tasked approach as the storm drain system. The first task will consist of inspecting and mapping the entire system. Specifically, areas of apparent industrial pollution and sewer system geometry will be determined. The second task will consist of reviewing available information in order to locate sewer system sampling points and monitoring well

installation locations. The third task will consist of installing and sampling monitoring wells and also sampling the contents of the sanitary sewer system. The groundwater chemistry in areas adjacent to the system and the chemistry of the sewer system water will be evaluated to determine if a release has occurred.

- **Task 1 - Sanitary Sewer Inspection and Mapping:** The existing sanitary sewer system will be inspected for evidence of industrial pollution (i.e., oil staining, industrial process water, etc.). The accuracy of the sewer system maps will be verified during the inspection process. The distance from manhole rim to sewer invert will be measured to the nearest 0.1 foot for a representative number of manholes and compared to data compiled during the UTS. A representative number of manhole rim elevations and locations will be surveyed and compared to existing data generated during the UTS.

- **Task 2 - Sewer System Hydrogeologic Characterization and Sampling Point Identification:** The sewer system elevations will be compared to groundwater elevations to identify and differentiate the portions of the sewer system that occur above the water table from the portions that occur below the water table. During the water-level evaluation, regional groundwater geometry will be evaluated for evidence indicating that the sanitary sewer system acts as either a groundwater source or as a groundwater sink.

  Data generated during Task 1 and Task 2 will be evaluated to determine the placement of an anticipated 10 to 20 monitoring wells. Monitoring wells will be located to characterize the following anticipated sanitary sewer system conditions:

  - The sewer system appears to act as a groundwater sink;
  - The sewer system appears to act as a groundwater source;
  - The sewer system appears to have received industrial pollution; and
  - The sewer system is known to be in "poor" physical condition and likely to be leaking.

  Monitoring wells will be placed adjacent to sanitary sewer system access points, if possible.

- **Task 3 - Groundwater and Sanitary Sewer Water Sampling:** During sampling, both the monitoring well and the sanitary sewer system will be sampled. Groundwater from monitoring wells and water from the sanitary sewer will be submitted for chemical analysis. The chemistry of

the groundwater and sanitary sewer water will be evaluated for evidence of chemical releases to the environment. Water levels at wells installed during this investigation will be compared to regional water levels to evaluate whether the sewer system acts as either a groundwater source or sink. Water chemistry data for wells adjacent to the sanitary sewer system generated during previous HPA investigations will be evaluated for evidence of sanitary sewer system/hydrogeologic interaction and chemical release.

The rationale for the proposed tasks is presented in Table 22. All tasks will be conducted in accordance with the general procedures described in Section 3.0 and the HPA QAPjP (*HLA, 1988b*).

2.3.6.4 Storm Drain and Sanitary Sewer Systems Analytical Program

On the basis of the classes of chemicals identified in storm drain sediments (*HLA, 1991b*) and the activities reported to have occurred within the drainage areas of the existing storm and sanitary sewer systems, sediment samples collected during Storm Drain Tasks 1 and 3 and water samples collected during Sanitary Sewer Task 3 and submitted to the chemical laboratory will be analyzed for the following parameters:

- CLP VOCs;
- CLP SOCs;
- CLP PCBs/Pesticides;
- Priority Pollutant Metals plus barium, cobalt, molybdenum and vanadium using CLP methods;
- Hexavalent Chromium;
- Cyanide;
- TPH as Diesel and Gasoline;
- Total Recoverable Hydrocarbons;
- Fecal Coliform*; and
- pH.

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* To be conducted on water samples only.

All analyses will be performed by a laboratory certified by the State of California and the U.S. EPA for CLP analyses and by the Navy (through NEESA) for the analyses requested. Analyses performed on samples collected from the storm drains will be required to meet the detection limit goals established in the Quality Assurance Project Plan (QAPP) for the Environmental Sampling and Analysis Plan (*ATT, 1991*). The estimated number of samples to be analyzed, the sample media, and the analytical methods to be used are summarized in Table 3.

3.0 FIELD PROCEDURES

Planned activities for the proposed underground utilities SIs include:

- Conducting geophysical surveys;
- Trenching and soil sampling;
- Sampling waste oils;
- Sampling storm drain sediments;
- Sampling sanitary sewer water;
- Drilling and sampling soil borings;
- Installation and sampling monitoring wells;
- Hydrostatic pressure testing of utilities;
- Tracer gas methods; and
- Performing video camera inspection of utilities.

These field activities will be conducted as generally described in the HPA QAPjP (*HLA, 1988b*), HPA Site Safety Plan (*HLA, 1988a*), and in Section 4.0 of the Group II Sampling Plan (*HLA, 1988d*). Sampling locations are discussed in Section 2.0 of this work plan. Field procedures, decontamination procedures, QA/QC procedures, and the Site Safety Plan are described below.

3.1 Geophysical Surveys

Geophysical surveys will be conducted to verify the locations of utilities. Both ground penetrating radar (GPR) and electromagnetic (EM) surveys will be performed to delineate the locations of utilities. These geophysical techniques are useful noninvasive methods for locating utilities lines. The procedures for these geophysical methods are described in Sections 5.2.1 and 5.2.2 of the QAPjP (*HLA, 1988b*).

3.2 Trenching and Soil Sampling

Methods for excavating trenches were not discussed in the QAPjP. Trenches will be excavated adjacent to utilities after utility locations have been determined using surface geophysical methods. A backhoe will be aligned parallel to the pipeline to provide visual confirmation of the pipelines. Excavated materials from the trenches and visible trench walls will be logged in accordance with Section 6.2 of the QAPjP (*HLA, 1988b*). All logging will be performed from the surface; no personnel will enter the trenches. Soil samples from locations adjacent to, or directly beneath, the utilities will be collected and submitted for chemical analyses. Upon completion of visual inspection and classification of the subsurface materials, the materials removed during trenching operations will be placed back into the trenches in approximately the reverse order in which they were excavated.

3.3 Storm Drain Sediment Sampling

Utilities meeting confined space criteria, such as storm drains and sanitary sewers, will not be entered. Samples will be collected from outside the confined space with either a grab dredge or a stainless steel sampling tube attached to an extension handled grab sampler. Sampling equipment will be decontaminated by washing with phosphate-free detergent and rinsing with distilled, deionized or clean water as appropriate, and/or, steam cleaned between samples.

If water is present in the storm drain system it will be analyzed for field parameters of pH, conductivity, turbidity and temperature using procedures outlined in the HPA QAPjP (*HLA, 1988b*).

3.4 Drilling and Sampling of Soil Borings

Borings for the collection of soil samples will be drilled using a hollow-stem auger drill rig in accordance with the procedures described in Sections 6.1, 6.2, and 6.3 of the QAPjP (*HLA, 1988b*).

Soil samples from each boring will be collected between 0.5 and 1.0 foot bgs and at 2.5-foot intervals to the total depth of the borings. Soil samples will be collected using a split-barrel sampler lined with stainless steel sample tubes as described in Section 7.2 of the QAPjP (*HLA, 1988b*).

Soil samples from areas adjacent to the utilities will be submitted for laboratory analysis (Table 3).

All borings will then be backfilled with a mixture of neat cement containing approximately 5 percent bentonite. The calculated and actual volume of grout used for backfilling borings will be recorded. Soil produced during drilling operations will be containerized and properly disposed (Section 10.2 of the QAPjP [*HLA, 1988b*]).

3.5 Installation and Sampling of Monitoring Wells

At selected locations, single-cased groundwater monitoring wells will be installed in borings drilled using the hollow-stem auger method. The wells will be used to monitor groundwater in the A aquifer, which consists of fill. Monitoring well installation procedures and well construction methods are presented in Sections 6.5 and 6.5.1 of the QAPjP (*HLA, 1988b*). The wells will be constructed of 4-inch-diameter polyvinyl chloride (PVC) screen and casing. The screen will extend from a maximum of 5 feet above the water table to a maximum of 10 feet below the bottom of the sewer invert. The minimum depth of the surface seal will be 3 feet bgs; therefore, where groundwater is present at less than 8 feet bgs, the screen will extend less than 5 feet

above the water table. The calculated and actual volume of grout, bentonite, and filter pack material used for construction of the wells will be recorded on the drill logs.

Following installation, the wells will be developed as described in Section 6.6 of the QAPjP (*HLA, 1988b*). Groundwater sampling procedures will be in accordance with Section 8.1 of the QAPjP (*HLA, 1988b*). Temperature, pH, conductivity, and turbidity will be measured during sampling of all monitoring wells. If free product is encountered, the thickness of that layer will be measured in accordance with Section 8.2 of the QAPjP (*HLA, 1988b*). Drill cuttings and groundwater produced during monitoring well installation, development and sampling will be containerized, sampled, and properly disposed (Section 10.2 of the QAPjP [*HLA, 1988b*]).

3.6 Sanitary Sewer Water Sampling

Sanitary sewer sampling procedures will be in accordance with Section 8.3 of the QAPjP (*HLA, 1988b*). Samples will be collected using a Kemmerer-type sampler and decanted directly into sample bottles. Field parameters will not be measured for sanitary sewer water samples.

3.7 Sample Numbering System

To enable submittal of blind samples to the laboratory, each sample is assigned a unique eight-digit number (e.g., 9115C042). The first two digits represent the year sampled (*1991*), the third and fourth represent the week of the year collected (15th week in 1991), the fifth represents the designated letter of the sampler (sampling person "C") and the remaining three represent the sequential sample number for the sampling person (C) taken over the life of the project (42nd sample taken at HPA by "C"). This is the only sample number provided to the chemical laboratory. Sample location, media, and depth are recorded in the project record for cross reference purposes.

3.8 Decontamination Procedures

Decontamination of sampling and drilling equipment will be conducted by washing or steam cleaning (high pressure, hot water wash) in accordance with the procedures described in Section 10.1 of the QAPjP (*HLA, 1988b*). Decontamination of all soil and groundwater sample collection containers (e.g., bailers) will be conducted by washing with phosphate-free detergent and rinsing with distilled, deionized (DI), or clean water, as appropriate. The decontamination water will be containerized along with the liquids produced during well development and sampling; the combined fluids will be sampled and properly disposed (Section 10.2 of the QAPjP [*HLA, 1988b*]).

Decontamination of samplers used for the sanitary sewer sampling will be immersed (for a minimum of 15 minutes) in a trough containing a dilute solution of chlorine bleach and water. Approximately 2 ounces of bleach per 5 gallons of water will be used.

3.9 QA/QC Procedures

Quality Assurance/Quality Control (QA/QC) procedures followed during the SIs will include calibration of field and laboratory equipment; analysis of field and laboratory QA/QC samples; and data reduction, validation, and reporting, as described in Sections 12.0, 14.0, and 15.0 of the QAPjP (*HLA, 1988b*), respectively. Sample container, handling, and preservation requirements for groundwater, sanitary sewer water, soil, and sediment samples are summarized in Table 23. The proposed field QC samples are listed in Table 24. The required laboratory QA/QC samples are summarized in Table 25. The sample custody procedures defined in Section 11.0 of the QAPjP (*HLA, 1988b*) will be followed.

3.10 Site Safety Plan

A hazard potential analysis will be prepared for each utility prior to field work. This analysis will be incorporated into site-specific safety plans that will identify potential safety hazards, personal protective equipment, and safety monitoring procedures for each site. Standard health and safety procedures, described in the HPA Site Safety Plan (*HLA, 1988a*) and in the Health and Safety Program, Revision 1 (*PRC, 1991*), will be followed.

4.0 SCHEDULE

It is anticipated that the tasks identified in this work plan could begin within 2 months of contract award. The reconnaissance tasks (Task 1) will begin first, followed by intrusive activities if needed. It is anticipated that Task 2 activities will begin between 2 and 4 months after Task 1 activities are completed. A proposed schedule is presented on Plate 25.

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TABLES

Table 1.
Chemical Analyses of Oil in Steamline at the South Pier
Site Inspection Work Plan: Underground Utilities

Sample ID SP-STM-1	Analyte	Results	Units
	TPH as Gasoline	76,000	mg/kg
	TPH as Kerosene	<10	mg/kg
	TPH as Fuel Oil	330,000	mg/kg
	PCBs	<1	mg/kg
	Metals		
	Antimony	<0.50	mg/kg
	Arsenic	<0.50	mg/kg
	Barium	14	mg/kg
	Beryllium	<0.30	mg/kg
	Cadmium	<0.25	mg/kg
	Chromium (total)	<1.3	mg/kg
	Cobalt	<5.0	mg/kg
	Copper	<2.5	mg/kg
	Lead	<1.3	mg/kg
	Mercury	<0.05	mg/kg
	Molybdenum	<5.0	mg/kg
	Nickel	8.0	mg/kg
	Selenium	<0.50	mg/kg
	Silver	<0.50	mg/kg
	Thallium	<0.50	mg/kg
	Vanadium	18	mg/kg
	Zinc	3.0	mg/kg

ND = Not Detected
< = Result is below value shown.

Table 2.
Rationale for Proposed Tasks, Steamlines
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Map Preparation	Entire extent of suspected pipelines	Verify location of the steamlines and investigate the number of suspected lines
Task 2 Sampling of Steamline Contents	Selected locations along the steamlines	Delineate the extent of waste oil within the steamlines.
Task 3 Inspection and Testing of Steamline Integrity	Area of waste oil contamination	Investigate the condition and integrity of the steamlines where they are contaminated with waste oil
Task 4 Trenching	Area where integrity of the line or visual inspection indicate that a release is possible	Evaluate whether a release to the environment has occurred

Table 3.
Proposed Analytical Program
Site Inspection Work Plan: Underground Utilities

Proposed Analysis	Steamlines Task 2 Oil	Steamlines Task 4 Soil	Fuel Lines Tank Farm Task 2 Soil	Fuel Lines Tank S-505 Task 2 Soil	Fuel Lines Buildings 203 and 205 Task 2 Soil	Sanitary Sewers Task 3 Groundwater	Sanitary Sewers Task 3 Sanitary Sewer Water	Storm Drains Task 1[1] Sediment	Storm Drains Task 3 Soil
CLP VOCs	23	10-20	13	6	13	10-20	10-20	53	10-20
CLP SOCs	23	10-20	13	6	13	10-20	10-20	53	10-20
CLP PCBs/Pesticides	23	10-20	13	6	13	10-20	10-20	53	10-20
Priority Pollutant Metals plus barium, cobalt, molybdenum and vanadium using CLP Methods	23	10-20	13	6	13	10-20	10-20	53	10-20
Hexavalent Chromium EPA Method 7196, SW-846	-	-	-	-	-	10-20	10-20	53	10-20
CLP Cyanide	-	-	-	-	-	10-20	10-20	53	10-20
TPH Gasoline[2] DHS Test Method, LUFT Manual	23	10-20	13	6	13	10-20	10-20	53	10-20
TPH Diesel[2] DHS Test Method, LUFT Manual	23	10-20	13	6	13	10-20	10-20	53	10-20

Table 3.
Proposed Analytical Program
Site Inspection Work Plan: Underground Utilities
(continued)

Proposed Analysis	Steamlines Task 2 Oil	Steamlines Task 4 Soil	Fuel Lines Tank Farm Task 2 Soil	Fuel Lines Tank S-505 Task 2 Soil	Fuel Lines Buildings 203 and 205 Task 2 Soil	Sanitary Sewers Task 3 Groundwater	Sanitary Sewers Task 3 Sanitary Sewer Water	Storm Drains Task 1[1] Sediment	Storm Drains Task 3 Soil
Total Recoverable Hydrocarbons EPA Test Method 418.1	23	10-20	13	6	13	10-20	10-20	53	10-20
Fecal Coliform Standard Method 9221C	-	-	-	-	-	10-20	10-20	-	-
pH EPA Method 9045 (soil)	23	10-20	13	6	13	10-20	10-20	53	10-20
Asbestos[3]	23	10-20							

1 Leaking Underground Fuel Tank (LUFT) Field Manual, October 1989, Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure, State of California, Leaking Underground Fuel Tank Task Force.

2 Detection limits for sediment samples collected from stormdrains (Task 1) are specified in the Quality Assurance Project Plan (QAPP) for the Environmental Sampling and Analysis Plan (ESAP).

3 Asbestos analysis will be performed using polarizing light microscopy according to procedures described in 40 CFR 763, Appendix A to Subpart F, "Interim Method for the Determination of Asbestos in Bulk Insulation Samples."

Table 4.
Rationale for Proposed Tasks, Fuel Distribution Lines, Tank Farm
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Geophysics	Entire extent of suspected pipelines	Map location of the fuel lines
Task 2 (If needed) Trenching	Along pipeline in areas where condition of pipeline is suspect	Sample soil to evaluate soil chemistry near the fuel lines.

Table 5.
Rationale for Proposed Tasks, Fuel Distribution Lines, Tank S-505
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Geophysics	Entire extent of suspected pipelines	Map location of the fuel lines
Task 2 Trenching	Along pipeline in areas where condition of pipeline is suspect	Evaluate the condition of the fuel lines. Verify the location and depth of the lines. Sample soil to evaluate soil chemistry near the fuel lines.

Table 6.
Rationale for Proposed Tasks, Suspected Steamlines, Former Building 503
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Geophysics	Entire extent of suspected pipelines	Evaluate existence of pipeline. Map location of the chemical distribution lines
Task 2 (If needed) Trenching	Along pipeline in areas where condition of pipeline is suspect	Evaluate the condition of the fuel lines. Verify the location and depth of the lines. Sample soil to evaluate soil chemistry near the fuel lines.

Table 7.
Rationale for Proposed Tasks, Fuel Distribution Lines, Buildings 203 and 205
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Geophysics	Entire extent of suspected pipelines	Map location of the fuel lines
Task 2 Trenching	Along pipeline in areas where condition of pipeline is suspect	Evaluate the condition of the fuel lines. Verify the location and depth of the lines. Sample soil to evaluate soil chemistry near the fuel lines.

Table 8.
Summary of Detected Chemicals, Storm Drain Sediment Samples
Site Inspection Work Plan: Underground Utilities

Analyte	Units	Station SW1	Station SW2	Station SW3	Station SW4
CLP VOC					
vinyl chloride	µg/kg	ND(24)	ND(16)	ND(26)	14000
carbon disulfide	µg/kg	4	ND(8)	ND(13)	4
1,1-dichloroethene	µg/kg	ND(12)	ND(8)	ND(13)	62
1,1-dichloroethane	µg/kg	ND(12)	ND(8)	ND(13)	5
1,2-dichloroethene (total)	µg/kg	ND(12)	ND(8)	ND(13)	15000
trichloroethene	µg/kg	ND(12)	ND(8)	ND(13)	9
benzene	µg/kg	ND(12)	ND(8)	ND(13)	14
toluene	µg/kg	ND(12)	ND(8)	ND(13)	600
chlorobenzene	µg/kg	ND(12)	ND(8)	ND(13)	200
ethyl benzene	µg/kg	ND(12)	ND(8)	ND(13)	330
xylenes	µg/kg	ND(12)	ND(8)	ND(13)	1900
CLP SOC					
phenol	µg/kg	550	ND(2900)	ND(4700)	3100
1,4-dichlorobenzene	µg/kg	ND(4400)	ND(2900)	ND(4700)	14000
1,2-dichlorobenzene	µg/kg	ND(4400)	ND(2900)	ND(4700)	42000
4-methylphenol	µg/kg	6900	ND(2900)	ND(4700)	ND(3100)
benzoic acid	µg/kg	3600	ND(14000)	ND(23000)	ND(15000)
2-methylnapthalene	µg/kg	ND(4400)	ND(2900)	ND(4700)	390
dimethyl phthalate	µg/kg	8800	ND(2900)	ND(4700)	ND(3100)
fluorene	µg/kg	ND(4400)	ND(2900)	ND(4700)	770
pentachlorophenol	µg/kg	3200	ND(14000)	ND(14000)	ND(14000)
phenanthrene	µg/kg	1900	680	ND(4700)	2200
anthracene	µg/kg	ND(4400)	ND(2900)	ND(4700)	1700
fluoranthene	µg/kg	2600	1000	ND(4700)	4500
pyrene	µg/kg	2400	580	610	4100
butylbenzylphthalate	µg/kg	840	ND(2900)	880	1500
benzo(a)anthracene	µg/kg	900	ND(2900)	ND(4700)	ND(3100)
chrysene	µg/kg	1600	540	ND(4700)	4600
di-n-octylphthalate	µg/kg	ND(4400)	ND(2900)	ND(4700)	1800
benzo(b)fluroanthene	µg/kg	1600	600	ND(4700)	3100
benzo(k)fluoranthene	µg/kg	1600	600	ND(4700)	3100
benzo(a)pyrene	µg/kg	780	ND(2900)	ND(4700)	1500
CLP Pesticides/PCBs					
aroclor-1260	µg/kg	6000	24000	4100	2800
TPH diesel	mg/kg	9900	850	840	4600
TPH gasoline	mg/kg	ND(20)	ND(20)	ND(20)	240
Oil & Grease	mg/kg	32500	4200	6400	39600

Table 8.
Summary of Detected Chemicals, Storm Drain Sediment Samples
Site Inspection Work Plan: Underground Utilities

(cont.'d)

Analyte	Units	Station SW1	Station SW2	Station SW3	Station SW4
CLP-CVAA					
mercury	mg/kg	0.3	0.76	0.66	0.98
CLP-FUAA					
arsenic	mg/kg	9.3	6.3	8.1	6.9
lead	mg/kg	449	334	378	473
selenium	mg/kg	ND(3.7)	ND(2.4)	5	ND(1.8)
CLP-ICP					
aluminum	mg/kg	9000	11000	20800	7300
barium	mg/kg	98.7	78.7	366	393
beryllium	mg/kg	0.41	0.9	1.3	0.49
cadmium	mg/kg	2	0.47	1.3	7.8
calcium	mg/kg	7200	5490	12200	11800
chromium	mg/kg	99.8	692	200	135
cobalt	mg/kg	10.4	16.8	30.3	10.9
copper	mg/kg	573	204	268	1170
iron	mg/kg	21600	23600	37300	24000
magnesium	mg/kg	10800	21800	37000	8190
manganese	mg/kg	220	521	924	306
nickel	mg/kg	94.3	152	331	89.4
potassium	mg/kg	1320	1250	3190	969
silver	mg/kg	1.9	2	1.6	1.8
sodium	mg/kg	9880	6110	14800	6050
vanadium	mg/kg	33.7	43.4	71.2	34.3
zinc	mg/kg	1490	489	545	1470
molybdenum	mg/kg	16.5	11.1	ND(3.8)	13.9

NOTES:

ND(10):Not Detected at Detection Limit Shown in Parentheses

Table 9.
Summary of Detected Chemicals, Pre-Storm-Event Water Samples
Site Inspection Work Plan: Underground Utilities

Analyte	Units	Station SW1	Station SW2	Station SW3	Station SW4
CLP VOC					
vinyl chloride	µg/l	ND(10)	ND(10)	ND(10)	2
1,2-dichloroethene (total)	µg/l	ND(5)	14	ND(5)	16
trichloroethene	µg/l	ND(5)	17	ND(5)	30
CLP SOC					
4-methylphenol	µg/l	5	ND(10)	ND(10)	ND(10)
CLP Pesticides/PCBs					
aroclor-1260	µg/l	3.8	ND(1)	ND(1)	ND(1)
TPH diesel	mg/l	0.9	ND(0.05)	0.067	0.36
TPH gasoline	mg/l	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Oil & Grease	mg/l	ND(5)	ND(5)	ND(5)	ND(5)

NOTES

* : Analysis Not Performed
ND(10):Not Detected at Detection Limit Shown in Parentheses

Source: HLA (1991b)

Table 9.
Summary of Detected Chemicals, Pre-Storm-Event Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW1		Station SW2		Station SW3		Station SW4	
		Soluble	Total	Soluble	Total	Soluble	Total	Soluble	Total
CLP-CVAA									
mercury	µg/l	ND(0.2)	*	0.24	*	ND(0.2)	*	ND(.02)	*
CLP-FUAA									
antimony	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	3.5	3.6
arsenic	µg/l	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
lead	µg/l	12.4	1.3	23.6	ND(1)	1.7	ND(1)	17.6	9.9
selenium	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
thallium	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	5.3	ND(2)	ND(2)
CLP-ICP									
aluminum	µg/l	1650	2870	2770	2280	1370	1520	480	1390
barium	µg/l	ND(20)	ND(20)	ND(20)	ND(20)	64	73.8	30.8	42.5
beryllium	µg/l	ND(1)	21	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
cadmium	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
calcium	µg/l	346000	377000	344000	370000	360000	361000	121000	127000
chromium	µg/l	2360	2600	2380	2640	1580	1600	772	915
cobalt	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
copper	µg/l	ND(60)	ND(60)	115	212	ND(60)	ND(60)	168	122
iron	µg/l	616	735	1220	376	463	438	647	715
magnesium	µg/l	1120000	1210000	1110000	121000	808000	795000	355000	375000
manganese	µg/l	ND(1)	ND(1)	37.5	ND(1)	3060	3040	85.8	139
nickel	µg/l	ND(8)	ND(8)	ND(8)	ND(8)	ND(8)	ND(8)	ND(8)	ND(8)
potassium	µg/l	285000	356000	317000	335000	190000	197000	102000	122000
silver	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)

NOTES:

* : Analysis Not Performed
ND:Not Detected at Detection Limit Shown in Parentheses

Source: HLA (1991b)

Table 9.
Summary of Detected Chemicals, Pre-Storm-Event Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW1		Station SW2		Station SW3		Station SW4	
		Soluble	Total	Soluble	Total	Soluble	Total	Soluble	Total
CLP-ICP (cont.'d)									
sodium	µg/l	9120000	10000000	9040000	9960000	6060000	6140000	3040000	3350000
vanadium	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
zinc	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	644	604
chromium IV	µg/l	43	*	ND(20)	*	27	*	ND(20)	*
EPA 300.0									
sulfate	mg/l	2420	*	2300	*	1320	*	704	*
chloride	mg/l	31200	*	17400	*	12300	*	3260	*

NOTES:

* : Analysis Not Performed
ND:Not Detected at Detection Limit Shown in Parentheses

Source: HLA (1991b)

Table 10.
Summary of Detected Chemicals, Storm Event Runoff and Storm Drain Water Samples
Site Inspection Work Plan: Underground Utilities

Analyte	Units	Station SW1		Station SW2		Station SW3	Station SW4	
		Runoff	Storm Drain	Runoff	Storm Drain	Storm Drain	Runoff	Storm Drain
CLP VOC								
1,2-dichloroethene (total)	µg/l	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	2.0-2.0
trichloroethene	µg/l	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	1.0-5.0
benzene	µg/l	ND(5)	ND(5)	ND(5)	1.0	ND(5)	ND(5)	ND(5)
CLP SOC								
phenol	µg/l	ND(10)	ND(10)	2.0-3.0	ND(10)	ND(10)	ND(10)	ND(10)
CLP Pesticides/PCBs								
aroclor-1260	µg/l	3.2	2.4-5.0	ND(1)	2.2	ND(1)	ND(1)	ND(1)
TPH diesel	mg/l	ND(0.05)	0.65-3.4	ND(0.05)	0.91	0.64-1.1	ND(0.05)	0.59-1.0
TPH gasoline	mg/l	ND(0.05)	5.0	ND(0.05)	ND(0.05)	0.25	ND(0.05)	ND(0.05)
Oil & Grease	mg/l	ND(5)	6.7-65	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)

NOTES:

ND(10):Not Detected at Contract Required Quantitation Limit

Table 10.
Summary of Detected Chemicals, Storm Event Runoff and Storm Drain Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW1				Station SW2			
		Runoff		Storm Drain		Runoff		Storm Drain	
		Soluble	Total	Soluble	Total	Soluble	Total	Soluble	Total
CLP-CVAA									
mercury	µg/l	0.23	0.38	ND(0.2)	0.32-0.49	ND(0.2)	0.32	ND(0.2)	0.32
CLP-FUAA									
arsenic	µg/l	ND(2)	3.1	2.2	3.5	ND(2)	ND(2)	ND(2)	ND(2)
lead	µg/l	31.5-123	34.7-158	27.9-72.2	72.4-124	19.7-40.1	25.5-46.4	25.2-70.6	27.5-86
selenium	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	3.4
CLP-ICP									
aluminum	µg/l	ND(19)	700-1630	ND(19)	619-2600	ND(19)	1010-2010	ND(19)	600-3360
antimony	µg/l	ND(14)	17.9-20	ND(14)	14.5-26.3	ND(14)	14.7-25	ND(14)	15.4-21.9
barium	µg/l	58.8-176	26.2-184	ND(2)	28.8-46.7	44.4-82.8	25.6-52.6	ND(2)	24.4-49.6
beryllium	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
cadmium	µg/l	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
calcium	µg/l	3480	3560-3660	3610-7820	4260-7250	3250	3160	6690-9450	6840-9050
chromium	µg/l	ND(4)	7.6-23.2	ND(4)	8.9-16.9	ND(4)	6.7-12.5	7.1-16.1	7.6-62.4
cobalt	µg/l	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)	ND(4)
copper	µg/l	52.6-86.9	60.5-112	13.9-45.8	39.3-77.5	30.1-48.3	35-54	7.1-68.5	65.5-106
iron	µg/l	167-472	1390-3480	341-1640	969-4240	231-601	1480-2850	321-939	1130-5540
magnesium	µg/l	614-956	1170-1770	982-6070	2140-6860	660-929	1140-1700	3020-8960	4510-8790
manganese	µg/l	49.8-66.5	64-85.3	24.7-42	34.4-61	24.4-42.2	39.1-59	34-7-71.6	39.2-119
nickel	µg/l	ND(4)	8.3-19.7	ND(4)	8.8-18.9	ND(4)	7.8-11.2	ND(4)	7.1-33.9
potassium	µg/l	ND(68)	532-780	684-2800	984-1590	ND(68)	554-858	2030-3860	2570-3810
silver	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	2.2	ND(2)	ND(2)

NOTES:

ND(10):Not Detected at Instrument Detection Limit Shown in Parentheses

Table 10.
Summary of Detected Chemicals, Storm Event Runoff and Storm Drain Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW1				Station SW2			
		Runoff		Storm Drain		Runoff		Storm Drain	
		Soluble	**Total**	**Soluble**	**Total**	**Soluble**	**Total**	**Soluble**	**Total**
CLP-ICP (cont.'d)									
sodium	µg/l	ND(50)	3820-4740	894-39100	3630-37600	ND(50)	2580-3720	7690-24200	26900-72700
vanadium	µg/l	2.5-2.9	4.1-10.7	2.2-2.5	4-10.7	2.5	3.8-7.3	3-5.6	4.8-13.9
zinc	µg/l	204-639	248-711	200-488	215-607	163-232	152-214	176-575	183-579
molybdenum	µg/l	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
EPA 300.0									
sulfate	mg/l	ND(1)	NA	ND(1)	NA	ND(1)	NA	47	NA
nitrate as N	mg/l	0.66-0.59	NA	0.25-0.33	NA	0.16-0.32	NA	0.58-0.94	NA
chloride	mg/l	77	NA	20	NA	ND(.1)	NA	29-420	NA
o-phosphate as P	mg/l	ND(0.3)	NA	ND(0.3)	NA	ND(0.3)	NA	ND(0.3)	NA
EPA 7196									
chromium VI	mg/l	ND(0.05)	NA	ND(0.05)	NA	ND(0.05)	NA	ND(0.05)	NA

NOTES:

ND(10):Not Detected at Instrument Detection Limit Shown in Parentheses

Table 10.
Summary of Detected Chemicals, Storm Event Runoff and Storm Drain Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW3 Storm Drain		Station SW4 Runoff		Station SW4 Storm Drain	
		Soluble	Total	Soluble	Total	Soluble	Total
CLP-CVAA							
mercury	µg/l	0.27-0.31	0.32-0.78	ND(0.2)	0.26	ND(0.2)	0.32
CLP-FUAA							
arsenic	µg/l	2-2.6	2.6-5.3	ND(2)	ND(2)	3.4-6.5	2-5.3
lead	µg/l	44.9-78.6	42.3-103	26.7-90.2	12.7-88.2	42.3-18.6	20.7-51.5
selenium	µg/l	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
CLP-ICP							
aluminum	µg/l	ND(19)	1900-4980	ND(19)	1300-1770	ND(19)	363-1160
antimony	µg/l	ND(14)	ND(14)	ND(14)	ND(14)	ND(14)	ND(14)
barium	µg/l	30.4-53.6	37.2-73.8	10.1-40.5	42.4-53.2	ND(2)	24.2-39.5
beryllium	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
cadmium	µg/l	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
calcium	µg/l	108000-289000	27500-95300	4290-17200	4370-17400	3250-4110	2930-3660
chromium	µg/l	4.3-7.6	12.2-31.3	4.2	4.6-14.1	5.6	7.6-12.2
cobalt	µg/l	ND(4)	4.8-8.4	ND(4)	ND(4)	ND(4)	ND(4)
copper	µg/l	81.6-43.8	50.4-158	16-60.2	21.4-77.5	60.8-84.4	69.9-98.1
iron	µg/l	641-1840	3440-9190	358-436	394-2860	394	668-2360
magnesium	µg/l	41200-202000	43200-189000	302-918	479-1130	1250-2000	1670-2650
manganese	µg/l	184-766	205-779	15-33.3	20.1-54	27.6-47.4	33-53.8
nickel	µg/l	8.2-16	22.2-151	ND(4)	4.7-14.8	ND(4)	7.8-17.4
potassium	µg/l	28900-67200	28400-65200	ND(68)	279-602	1000-1280	1010-1330
silver	µg/l	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	2.7

NOTES:

ND(10):Not Detected at Instrument Detection Limit Shown in Parentheses

Table 10.
Summary of Detected Chemicals, Storm Event Runoff and Storm Drain Water Samples
Site Inspection Work Plan: Underground Utilities
(cont.'d)

Analyte	Units	Station SW3 Storm Drain		Station SW4 Runoff		Station SW4 Storm Drain	
		Soluble	Total	Soluble	Total	Soluble	Total
CLP-ICP (cont.'d)							
sodium	µg/l	288000-1520000	294000-1480000	ND(50)	1040-3080	8380-14100	8050-13300
vanadium	µg/l	3.9-5.4	ND(2)	2.0-2.0	6.3-8.1	ND(2)	ND(2)
zinc	µg/l	154-278	150-280	59-.3-597	143-598	345-547	331-472
molybdenum	µg/l	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
EPA 300.0							
sulfate	mg/l	100-390	NA	ND(1)	NA	ND(1)	NA
nitrate as N	mg/l	0.70-0.78	NA	0.12-0.19	NA	0.28-0.47	NA
chloride	mg/l	580-3200	NA	ND(0.1)	NA	12.0-26	NA
o-phosphate as P	mg/l	0.37-0.58	NA	ND(0.3)	NA	ND(0.3)	NA
EPA 7196							
chromium VI	mg/l	ND(0.05)	NA	ND(0.05)	NA	ND(0.05)	NA

NOTES:

ND(10):Not Detected at Instrument Detection Limit Shown in Parentheses

Table 11.
Activities Occurring at Suspect Sites Within Storm Drainage Area A
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
307	Electronic Assembly		Building title suspect, oil leaks on concrete floor, machinery leaking oil, floor cracked in places. Drums stored outside with oil, drip pan to contain leaks.
309	Sand Blast Plant Annex S-71		Building title suspect. No building at indicated location, some footings remain. Unpaved area. No apparent staining.
319	Sand Blast Plant Annex S-71		Building title suspect. No building at indicated location, some footings remain. Unpaved area. No apparent staining.
400	SOAP Storehouse		Friable asbestos pile; 6 oil filter canisters leaking, oil reservoir leaking; 2 transformers in storage, 1 leaking; oil filtering unit leaking
404A	Storehouse		Covered open storage area with soil floor. Stored electrical machinery.
405	Storehouse		Undetermined floor drainage; probable bacterial waste.
406	Storehouse		Outdoor waste oil storage; 2 leaking drums.
413	Storehouse and Yard		Large quantities of oil and waste oils stored; some damaged drums. Waste oil between buildings 413 and 414. Spillage on pallets; oil stained soil (30' x 5').
414	Public Works Furniture Storehouse and Yard		Waste stored in yard between 413 and 414 (refer to 413). Some spillage and open containers.
439	Sheet Metal Shop		Open drum of oil abandoned.
500	CPO Barracks		No documentation of tank removal. Piping left in place.
505	Navy Exchange		Possible SOCs in soil.
506	Radiological Research Operations/ Housing, Navy Exchange & ROICC Offices		Building title suspect. No building at indicated location. Vacant lot. Oil staining and debris on ground.
507	Radiological Research Operations/ Public Works Office		Building title suspect. No building at indicated location. Vacant lot. No apparent staining.
510	Radiological Research Operations/ Naval Investigation Service		Building title suspect. No building at indicated location. Vacant lot. Stained soil.

Table 11.
Activities Occurring at Suspect Sites Within Storm Drainage Area A
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
511A	Wood Working Hobby Shop		Building title suspect. No building at indicated location. Some footings and foundation remain. No apparent staining.
524	Commissary Storehouse		Building title suspect. Possible SOCs in soil.
525	Storehouse		Large winches outside building with evidence of oil leaks, discolored soils.
530	Public Works Building (formally Automotive Hobby Shop)		Soil staining adjacent to building. Average continuous flow of 300 gallons per day to combined sewer of water with detergents from car washing operations. (Westec, 1984)
704	Transportation Shop Shelter, S-02		Building title suspect.
707	NRDL Animal Colony		Wet Well, friable asbestos. Possible SOCs in soil.
709	Navy Exchange Gas Station		Building title suspect.
710	Latrine		Possible SOCs in soil
807	Scrap Yard Shed		Burned building. Empty cardboard drums inside. No apparent leakage or staining on soil adjacent to building.
809	Storehouse		Building title suspect.
810	Storehouse		Drums are leaking.
812	Sandblast Shed, S-71		Building title suspect. No building at indicated location. Unpaved vacant lot. No apparent staining.
816	NRDL - High Voltage Accelerator/Radiological Defense Lab		Friable ceiling and pipe lagging, spillage noted.
818	Chlorinating Plant		Six chlorine cylinders. Possible stained area north of pavement. No building at indicated location, only footings remain. Asphalt paved area inside of footings. Garbage piled in paved area.
819	Sewage Pump Station "A"		Building title suspect. Active. No chemical storage, leakage, or odors.
821	X-Ray Shield Facility		Building title suspect. No apparent staining outside.

Table 11.
Activities Occurring at Suspect Sites Within Storm Drainage Area A
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
IR-1	Industrial Landfill		Between 1958 and 1974, domestic, industrial, construction, and other wastes were disposed into the landfill. An estimated 21,000 gallons of liquid chemical wastes, 500 cubic yards of asbestos, and 6,000 pounds of low-level radioactive radium dials and knobs were disposed. Radioactive sandblast waste from ships decontaminated after nuclear testing may possible be present. In 1974 the landfill was covered with clean fill material. At this time a storm water intercepter line was constructed to prevent runoff from inundating the landfill. (HLA,1988d)
IR-2	Bay Fill Area		An estimated 237,000 tons of sandblast waste containing scrapings of steel, copper, lead, and paint have been disposed at IR-2. Radioactive sandblast wasted from ships decontaminated after nuclear testing may possible be present at the site. Other wastes that were disposed in this area include solvents, paints, waste oil, building and chip materials, and acid tank roofs. (HLA,1988d)
IR-3	Oil Reclamation Ponds		In 1944, two unlined oil reclamation ponds were constructed on the south shore of the Bay Fill Area. These ponds were used to process (for recycling) waste oil generated by ships and the industrial shops. In addition to hydrocarbons, waste including bilgewater, solvents, caustic soda, ethylene glycol, and chromates were apparently placed in the ponds. The waste oil was heated to separate the water and the reclaimed oil was removed from the ponds about three times a year. In 1974, the ponds were filled with soil. Sandblast waste was also allegedly disposed over the ponds by Triple A. (HLA,1988d)
IR-4	Scrap Yard		Stored used lead and copper from submarine batteries, and electrical capacitors containing PCBs. According to IAS, approximately 7,000 pounds of lead and copper residue and up to 250 gallons of PCBs from crushed capacitors may have been washed into the soil. Northern portion of site was also used to store debris, which included drums, pipe lagging, batteries, liquid waste, and scrap metal. Ground staining was observed and
IR-4	Scrap Yard (continued)		it is possible that chemicals drained into nearby storm sewers. (HLA,1988e)

Table 11.
Activities Occurring at Suspect Sites Within Storm Drainage Area A
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
IR-5	Old Transformer Storage Yard		Used electrical transformers were stored in an unpaved, open yard from 1946 to 1974. There are no records or reports of transformer oil spills, but it is possible that the transformers leaked oil containing PCBs. Aerial photographs indicate that the ground surface in the vicinity of the storage yard may have been sprayed with waste oil. (HLA,1988e)
IR-8	Building 503 PCB Spill Area		In 1986, a PCB spill area was discovered by the Navy during repair of an underground utility line. The suspected sources of PCBs are a nearby transformer pad and transformers on two power poles southeast of the area. (HLA,1988c)
IR-11	Power Plant		Building 521 housed a high-pressure boiler used to generate steam from 1950 to 1969; the building is currently vacant. The principal suspected problem is asbestos-containing insulation, which was used to insulate the steam generation system. Other possible sources of contaminants are cans of xylenes, paint, and metal conditioners stored on a concrete pad southeast of the buliding. (HLA,1990e)
IR-12	Disposal Trenches and Salvage Yard		The eastern portion of the site was previously used as a salvage yard by both the Navy and Triple A. Oily stains from chemical spillage have been observed on the ground in this open area and some waste reportedly ran into the storm drain. In 1986, leaking tins of oil and greenish liquids, as well as possible asbestos lagging, were observed on the ground in this open area. In the southwestern portion of the site, two waste disposal trenches were allegedly excavated and used by Triple A. Hazardous materials reportedly placed in these trenches include asbestos insulation, chlorinated solvents, corrosives, lead-based paints, lead, and acid from batteries. Along Sixth Avenue, next to the eastern boundary of the disposal trenches, a concrete drum-crushing pad was used to destroy 55-gallon drums that allegedly contained hazardous substances. (HLA,1990e)
IR-13	Old Commissary		During Triple A's occupancy, drums of liquid and oily dirt were reportedly stored onsite. Sand blasting waste was stored on concrete pads. Transformers, possible containing PCBs, were stored on the eastern side of the site. (HLA,1990e)

Table 11.
Activities Occurring at Suspect Sites Within Storm Drainage Area A
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
IR-14	Oily Liquid Waste Disposal Area		Triple A allegedly disposed of oily liquid waste on the ground and in a "gully area" somewhere within the open area between Buildings 505 and 521. The "gully area" was filled with sand at a later date and its location cannot be determined from existing surface conditions, or from available aerial photos. It has also been reported that drums, transformers, and chemical canisters were disposed of onsite; these materials are not currently apparent at the site. (HLA,1990e)
IR-15	Oily Waste Ponds and Incineration Tank		Site IR-15 consists of two areas which are northeast and northwest of Building 521 (site IR-11). In April of 1986, ponds of oily wastewater were observed in the western portion of the site; the ponds were reportedly not present prior to this time. A hose from tank S505 had apparently been used to fill the ponds. Staining from the ponds is no longer evident. In the portion of the site northeast of Building 521, a tank, two trash cans, and a dumpster were observed on April 4, 1986. The tank had apparently been used as an incinerator. The tank, dumpster, and trash cans reportedly contained copper plates, circuit boards, x-ray film and micellaneous trash. The tank was reportedly removed from the site in mid-July 1986, and visible staining remained on the ground at this time. The staining is no longer evident. (HLA,1988e)
IR-17	Drum Storage and Disposal Area		Triple A allegedly stored and disposed drums at this site. Containers labeled as containing PCBs and transmission oil were observed with other containers; the contents of the other containers were not reported. Visible stains were reported on the ground. (HLA,1988e)

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 12.
Activities Occurring at Suspect Sites Within Storm Drainage Area B
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
113	Tug Maintenance; Salvage Divers; Substation "S"	Yes	Oil stains on pavement from leaking hydraulic equipment.
114	Office Building		Acid reservoirs inside next to drain, in use.
115	COMSUBGRUSFRAN Office & Training Building		Tenants occupying building have small inventory of chemicals.
124	Acid Mixing Plant		The IAS indicated that active shipyard activities generated periodic discharge into the storm sewer of approx. 1,000 gallon per month of washdown water, which consisted of sulfuric acid and distilled water (Westec, 1984).
146	TACAN Facility, S-67		Unknown contents of many containers. HLA observed oil staining on pavement.
161	Maintenance Service Center, S-07		Building title suspect. No building at indicated location, unpaved vacant lot. No apparent staining.
162	Paint Storage, S-71		Building title suspect. No building at indicated location, unpaved area adjacent to boat ramp. No apparent staining.
906	Gardeners Tool Shed		Approximately 15 (1 to 5 gallon) containers of pesticides. Signs on wall indicating use of insecticides and other chemicals. Insecticides likely on wood and dirt-floored areas. Asbestos wallboard used.
IR-7	Sub-Base Area		The Sub-Base site includes the Painting Area, the Sandblast Fill Area, and the Additional Area. The Painting Area was used for painting submarine superstructures. The paints used were primarily zinc chromate-based. In addition, diesel fuel spills may have occurred during painting of submarine fuel lines. The Sandblast Fill Area, and to a lesser extent the Additional Area, were used as disposal sites for sandblast wastes generated from the Painting Area. The sandblast wastes contain metals, paint scrapings, and possibly radioactive material from decontamination of naval vessels exposed to nuclear detonations. (HLA,1988f)

Table 12.
Activities Occurring at Suspect Sites Within Storm Drainage Area B
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
IR-10	Battery and Electroplating Shop (Building 123)		From 1946 through 1974, Building 123 was used for electroplating and battery storage and maintenance. Waste acids containing heavy metals , cyanide wastes, and chromates were reportedly spilled onto the floor of the building and in the dock loading area. These wastes were discharged into a floor drain system, which connected into the storm sewer system that discharged into the bay. (HLA,1988c)

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 13.
Activities Occurring at Suspect Sites Within Storm Drainage Area C
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
125	Submarine Cafeteria		Possible SOCs in soil. Friable Asbestos
128	Shop Service and Work Control Center #1		Possible SOCs in soil. Contaminated runoff reported.
131	Substation "U", S-03		Building title suspect. No building at indicated location, asphalt covered area adjacent to pier. No apparent staining.
IR-6	Tank Farm		The Tank Farm was used by the Navy from 1942 until 1974 when the shipyard was decommissioned. Triple A reportedly also used the tanks during their lease period from 1976 to 1987. The site consists of ten above ground tanks, which were used for the storage of diesel and lubricating oil; waste oil may have been stored in one or more of the tanks by Triple A. These tanks include one 4,384-barrel (about 240,000 gallons) tank and nine 286-barrel (about 15,000 gallon) tanks. The nine smaller tanks are surrounded by an earthen containment berm; the larger tank is surrounded by a separate berm. A series of tank support racks is present at the western end of the Tank Farm; the associated tanks have been removed. It is likely that leaks or spills from the tanks or associated piping may have occurred sometime in the past because the soil around these tanks is stained. In 1944, there was a reported release of an unknown volume of hydrocarbons from a ruptured 286-barrel tank. The release apparently flowed beyond the containment berm. Additionally, some of the fuel piping is buried and the condition of the piping is unknown. (HLA,1988c)
IR-10	Battery and Electroplating Shop (Building 123)		From 1946 through 1974, Building 123 was used for electroplating and battery storage and maintenance. Waste acids containing heavy metals (mostly copper and lead), cyanide wastes, and chromates were reportedly spilled onto the floor of the building and in the dock loading area. These wastes were discharged into a floor drain system, which connected into the storm sewer system that discharged into the bay. (HLA,1988c)

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 14.
Activities Occurring at Suspect Sites Within Storm Drainage Area D
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
101	Administration Office/ Reproduction Department		The IAS indicated that active shipyard activities generated periodic discharge to the combined sewer of approximately 500 gallons per week from solution trays which contained hydrogen peroxide, ammonia, photo-developer solutions and various chemicals washed off print paper (Westec, 1984).
109	Police Station		Staining associated with reservoir abandoned outside.
113	Tug Maintenance; Salvage Divers; Substation "S"	Yes	Oil stains on pavement from leaking hydroequipment.
130	Shop Service		Friable asbestos. Large quantities in storage. Large quantities of chemicals.
134	Machine Shop & Q&RA	Yes#	Oil stains on concrete floor (possible PCBs), sawdust and absorbent materials on stains. Approximately 25 drums in good condition containing triflouromethane and trichloromonofluoroethane. Old solvent vats and transformers. The IAS indicated that active shipyard activities generated an average continuous flow of approximately 1 gpm discharged to the combined sewer. Discharge was from the cleaning of engine parts and the draining of chemical solution tanks containing Penesolve 814 and Penestrip CR (Westec, 1984).
135	Substation "G", S-03		Building title suspect. No access to building interior. Transformers contained PCB.
142A	Air Raid Shelter (Storage)		No building, only footings remain at indicated site. No apparent chemical storage or leakage.
156	Rubber Shop, S-56	Yes	Tenant Morgan Chemical is hazardous waste handler; survey illegible in parts; some staining.
157	Q&RA Ind. Lab Non-Destructive Test/Metal Fabrication Ranch		Empty building. Contents of open 500 gallon tank unknown. Stained area on dirt portion of floor in west end of building.
163	Rubber Shop Annex, S-56		Building title suspect. Pipes with asbestos lagging stacked. No other apparent chemical staining or leakage.

Table 14.
Activities Occurring at Suspect Sites Within Storm Drainage Area D
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
901	Commissioned Officers Mess		Suspected sandblast waste and oily material in landscape medium.
921	Bachelors Officers Quarters		Suspected sandblast waste and oily material in landscape medium.
IR-6	Tank Farm		The Tank Farm was used by the Navy from 1942 until 1974 when th shipyard was decommissioned. Triple A reportedly also used the tan during their lease period from 1976 to 1987. The site consists of ten above ground tanks, which were used for the storage of diesel and lubricating oil; waste oil may have been stored in one or more of the tanks by Triple A. These tanks include one 4,384-barrel (about 240,000 gallons) tank and nine 286-barrel (about 15,000 gallon) tanks. The nine smaller tanks are surrounded by and earthen containment berm; the larger tank is surrounded by a separate berm. series of tank support racks is present at the western end of the Tank Farm; the associated tanks have been removed. It is likely that leaks or spills from the tanks or associated piping may have occurred sometime in the past because the soil around the tanks is stained. In 1944, there was a reported release of an unknowr volume of hydrocarbons from a ruptured 286-barrel tank. The releas apparently flowed beyond the containment berm. Additionally, som of the fuel piping is buried and the condition of the piping is unknown. (HLA,1988c)
IR-10	Battery and Electroplating Shop (Building 123)		From 1946 through 1974, Building 123 was used for electroplating and battery storage and maintenance. Waste acids containing heavy metals, cyanide wastes, and chromates were reportedly spilled onto the floor of the building and in the dock loading area. These wastes were discharged into a floor drain syster which connected into the storm sewer system that discharged into th bay. (HLA,1988c)

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 15.
Activities Occurring at Suspect Sites Within Storm Drainage Area E
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
135	Substation "G", S-03		Building title suspect. No access to building interior. Transformers contained PCB.
203	Power Plant - Substation "H", S-03		Abandoned steam equipment; possible PCB oil. The IAS indicated that active shipyard activities generated Periodic discharge of approximately 1500 gallons 10 times per month to the combined sewer of boiler blowdown and backwash from zeolite water softeners. Softeners also contained dilute sulfuric acid and salts (Westec, 1984).
206	Substation "A" and Compressor Plant, S-03		Building title suspect. Active, no access. Transformers containing PCB oil.
211	Electric Shop, S-31 & 51		Bulging rectangular tank (<50 gallons) with unknown contents. Abandoned transformers with leakage and staining. The IAS indicated that active shipyard activities generated an average continuous flow of 1 gpm of liquid containing sodium hydroxide, D-Floate, Steam-Kleen compound, and various paints to combined sewer (Westec, 1984).
214	Combat Weapons Systems Office		Asbestos lagging on boiler, furnace, basement, floor, roof, pipes. Variably colored asphalt patches on pavement.
217	Sheet Metal Shop, S-17	Yes	The IAS indicated that active shipyard activities generated a discharge of approximately 300 gallons per month to combined sewer of liquids containing D-Floate and various paints from spray painting. Small quantity of dust and debris in sump (Westec, 1984).
219	Substation "E", S-03		Oil staining in parking lot.
224	Air Raid Shelter (Storage)		Empty concrete building with concrete floor, asphalt covering exterior ground surface. No chemical storage or leakage.
228	Central Cafeteria		Refrigerators, assorted cans of unknown chemicals.
230	Shop Service, S-56		Building title suspect. Oil stains on pavement and dirt areas at west end. Stains indicate drainage of oil toward storm drain.
231	Machine Shop, S-31	Yes	Leaking transformer. Metal shavings and oil stains on floor. Concrete debris lightly covered with sand. Several large oil sumps contain liquid.

Table 15.
Activities Occurring at Suspect Sites Within Storm Drainage Area E
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
			The IAS indicated that active shipyard activities generated a periodic discharge to combined sewer of approximately 3,000 gallons four times per month of anion softeners (caustic solution) and 1,500 gallon seven times per month of cation softeners (sulfuric acid solution). At the machine shop cleaning facility approximately 5,000 gallon of rinse water once per week and 3,000 gallons of chemical solution once per month were periodically discharged to the combined sewer. Chemical solution tanks contained sulfuric acid, phosphoric acid, sodium hydroxide, and dichloro benzene (Westec, 1984).
253	Electronics, Optical & Ordinance Shops	Yes	6-floor building, stained floor. Abandoned transformers and electrical equipment in storage. Leaking brown fluid. 1st floor (Ordinance Shops)- Periodic discharge to a combined sewer of 3,000 gallon of chemical solution tank 4 times per year. Tank contained sodium hydroxide, Stoddard solvent, Steam-Kleen, and various paints (Westec, 1984). 2nd, 4th & 5th floors (Electronic and Opitcal Shop)- Periodic discharge to a combined sewer of 300 gallon chemical solution tank once per month. Tank contained sodium hydroxide, Oakite aluminum cleaner 164, and various paints (Westec,1984).
270	Paint Shop, S-71		Ground is stained by two open tanks (15 gallons); two oil spills; three transformers not in use. Periodic discharge into a combined sewer of approximately 3,000 gallons from a chemical solution tanks four times per year. Chemicals discharged include sodium hydroxide and those from the cleaning of paint buckets (Westec, 1984).
271	Paint Shop Annex, S-71	Yes	White powdery spill; red liquid spill (4 sq. ft.); friable asbestos.
275	Sheet Metal Annex, S-17		Improper disposal of oil.
281	Electronics-Weapons Presion Facility and Machine Shop	Yes##	Non-spark wood flooring over concrete sub-floor buckled in several places, apparently where lifting gantry had leaked oil.
282	Abrasive Blast Facility		Oil staining on concrete (5' X 5').

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 16.
Activities Occurring at Suspect Sites Within Storm Drainage Area F
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
135	Substation "G", S-03		Building title suspect. No access to building interior. Transformers contained PCB.
203	Power Plant - Substation "H", S-03		Abandoned steam equipment; possible PCB oil. The IAS indicated that shipyard activities generated a periodic discharge of approximately 1500 gallons 10 times per month to the combined sewer of boiler blowdown and backwash from zeolite water softeners. Softeners also contained dilute sulfuric acid and salts (Westec, 1984).
215	Fire House		The IAS indicated that shipyard activities generated an average continuous flow of 300 gallons per day to combined sewer of liquids with detergent from washing (Westec, 1984).
217	Sheet Metal Shop, S-17	Yes	The IAS indicated that shipyard activities generated a discharge of approximately 300 gallons per month to the combined sewer of liquids containing D-Floate and various paints from spray painting. (Westec, 1984).
230	Shop Service, S-56		Building title suspect. Oil stains on pavement and dirt areas at west end. Stains indicate drainage of oil toward storm drain.
235	Supervision & Storage, S-17		No building at indicated location. Asphalt covered area. No apparent staining.
241	Forge Shop, S-23	Yes	Stained concrete floor, possibly associated with oil tanks (in use).
278	Work in Progress Storage, S-17		Building title suspect. No building at indicated location. Asphalt paved area. No apparent staining.
279	Material Storage Racks, S-17		Building title suspect. Empty building except for debris. Storm drain in floor. Two open 20-gallon drums containing oily liquid located between buildings 279 and 280. No apparent spillage or leakage.

Table 16.
Activities Occurring at Suspect Sites Within Storm Drainage Area F
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
280	Covered Work Area, S-17, Aluminum Cleaning Facility		Building title suspect. Empty building, some stained areas and cracked pavement. The IAS indicated that shipyard activities generated a periodic discharge to the combined sewer of a sodium phosphate tribasic solution tank once per week, a Wyandotte 2787 deoxidizer tank once every six months, and a 5,000 gallon rinse tank once per month (Westec, 1984).
282	Abrasive Blast Facility		Oil staining on concrete (5' X 5').

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 17.
Activities Occurring at Suspect Sites Within Storm Drainage Area G
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
274	Decontamination Training	Yes#	No apparent chemical storage or leakage in building interior. Underground vault outside building contains unknown liquid.
302	Transportation Shop, S-02	Yes	Some strong odors, elevated tanks. Leaking NaOH. Oily concrete floor, staining. Batteries, hydraulic lifts with below grade sumps. The IAS indicated that active shipyard activities generated Continuous average flow of 1 gpm disposed to combined sewer. Disposed liquid contained decarbonizer, degreaser, and detergent (Westec, 1984).
302A	Transportation Shop Annex, S-02	Yes	Sump area between buildings 302A and 304. Open containers, waste oil. Oil stained concrete floor.
304	Service Station, S-02	Yes	Above ground tanks are mobile and located outside building 304. Sumps located between buildings 302A and 304. Underground tank(s) and product lines probably still in place.
366	Boat & Plastic Shop, S-64		Runoff has oily sheen. Oily concrete floor. Approximately 20 drums stored outside with debris and shavings. Nine drums contain oil and viscous liquid. Some drums leaking and damaged. Oil stained soil observed. Periodic discharge to combined sewer of approximately 300 gallons of liquid once a week. Liquid contained epoxides, polyester resin, and methylethylketones (Westec, 1984).
368	Shop Service		Building title suspect. HLA observed 5 (55 gallon) drums of PCB oil.
369	Shop Service		Building title suspect. Large oil stain (40' X 20').
401	Public Works Shop, S-03 & 07		Minor spillage of paints.
415	Storehouse		Building title suspect. Empty building. No apparent chemical storage or leakage.
416	Storehouse		Building title suspect. Empty building. No apparent chemical storage or leakage.
435	Equipment Storage, S-07	Yes	The IAS indicated that active shipyard activities generated an average of 200 gallons per day disposed to the combined sewer. Disposed liquid contained various paints and paint thinners (Westec, 1984).

Table 17.
Activities Occurring at Suspect Sites Within Storm Drainage Area G
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
436	Material Storage, S-07		More than 100 1 to 5 gallon cans containing paints and solvents stored inside building. Some open. Deteriorated concrete floor.
819	Sewage Pump Station "A"		The IAS indicated that active shipyard activities generated a continuous average flow of 2 gpm and a periodic dischage of 500 gallon approximately twice a year to the combined sewer. Discharged liquids contained sodium hydroxide and detergents (Westec, 1984). Building title suspect. Active. No chemical storage, leakage, or odors.
IR-9	Pickling and Plate Yard		Between 1947 and 1973, the facility was used for industrial metal finishing and painting activities. One above-ground acid storage tank (empty), three brick-lined pickling tanks within a below-ground concrete vault, and an open plate-storage rack make up the existing facility. Concrete and asphalt cover most of the ground surface in the area. Chemicals used at the site include zinc chromate (paint primer), sodium dichromate, and sulfuric and phosphoric acids (in pickling tanks). Steel plates held on the storage racks were sprayed with zinc chromate primer. Approximately 15,000 gallons of acid-contaminated rinse water was discharged to the combined storm/sanitary sewer system each month. (HLA,1988c)

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 18.
Activities Occurring at Suspect Sites Within Storm Drainage Area H
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
274	Decontamination Training	Yes#	Non-friable asbestos wallboard. No apparent chemical storage or leakage in building interior. Underground vault outside building contains unknown liquid.
306	Substation "I", S-03		1 abandoned transformer; leaking transformer.
351	Electronics Shop		Abandoned spray booths on third and fourth floors. Improper waste disposal. The IAS indicated that active shipyard activities generated a continuous average flow of 1 gpm to the combined sewer. Liquids contained Chem-mist detergent, very small quantities of alcohol, and trichloroethylene and an average continuous flow of 30 gpm and periodic discharge of approximately 200 gallons per week to the combined sewer. Liquids contained ammonium thiosulfate, silver, salts, acetic acid, sodium sulfate, sodium carbonate, and minute quantities of cyanides. Also various chemical washed off print paper (Westec, 1984).
351A	Electronics Shop Annex		Asbestos lagging on pipes. Four carboard drums containing barium sulfate. Drums in good condition. No evidence of spillage or leakage. The IAS indicated that active shipyard activities generated an average continuous flow of 100 gallons per day to the combined sewer. Discharge contained Chem-mist detergent, and small amounts of thinner and solvent (Westec, 1984).
364	Storage Building/ Radiologic Research	Yes	Floor drain. Small quantities of "potentially very dangerous" chemicals. Vault behind building flooded with unknown liquid.
366	Boat & Plastic Shop, S-64		Runoff has oily sheen. Oily concrete floor. Approximately 20 drums stored outside with debris and shavings. Nine drums contain oil and viscous liquid. Some drums leaking and damaged. Oil stained soil observed. The IAS indicated that active shipyard activities generated a periodic discharge to the combined sewer of approximately 300 gallons of liquid once a week. Liquid contained epoxides, polyester resin, and methylethylketones (Westec, 1984).

Table 18.
Activities Occurring at Suspect Sites Within Storm Drainage Area H
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
401	Public Works Shop, S-03 & 07		Minor spillage of paints.
404A	Storehouse		Covered open storage area with soil floor. Stored electrical machinery.
408	Furnace Shelter, S-11		Two furnaces.
409	Welder Motor Generator Hut, S-11		Building title suspect. Oily rubbish.
410	Welder Motor Generator Hut, S-11		Building title suspect. Oily rubbish.
411	Ship Fitters Shop, S-11, 26,41	Yes	Two underground vaults. Hydraulic fluid leaking on floor. One abandoned transformer. The IAS indicated that active shipyard activities generated a periodic discharge of 15,000 gallon water rinse tank once per month to the combined sewer. Each 15,000 gallon chemical solution tank was discharged approximately 4 times per year. Tanks contained Wyandotte M.F. acid and Altrex cleaner, and Wyandotte 2487 acid. During the pickling of structural aluminum, an average continuous flow of 3 gpm and periodic discharge of approximately 6,000 gallons per week to the combined sewer. Tanks contained same chemicals as described above (Westec, 1984).
415	Storehouse		Building title suspect. Empty building. No apparent chemical storage or leakage.
416	Storehouse		Building title suspect. Empty building. No apparent chemical storage or leakage.
418	Q&RA Welding Engineering Facility		Acids stored outdoors, not bermed; minor acid spillage.
435	Equipment Storage, S-07	Yes	Possible sump. Average of 200 gallons per day disposed to combined sewer. Disposed liquid contained various paints and paint thinners (Westec, 1984).

Table 18.
Activities Occurring at Suspect Sites Within Storm Drainage Area H
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
438	Metal Spray Shelter, S-11		Sand covered floor of building.
439	Sheet Metal Shop		Open drum of oil abandoned.
IR-9	Pickling and Plate Yard		Between 1947 and 1973, the facility was used for industrial metal finishing and painting activities. One above-ground acid storage tank (empty), three brick-lined pickling tanks within a below-ground concrete vault, and an open plate-storage rack make up the existing facility. Concrete and asphalt cover most of the ground surface in the area. Chemicals used at the site include zinc chromate (paint primer), sodium dichromate, and sulfuric and phosphoric acids (in pickling tanks). Steel plates held on the storage racks were sprayed with zinc chromate primer. Approximately 15,000 gallons of acid-contaminated rinse water was discharged to the combined storm/sanitary sewer system each month. (HLA,1988c)

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 19.
Activities Occurring at Suspect Sites Within Storm Drainage Area I
Site Inspection Work Plan: Underground Utilities

Building Number/ IR Site Number	ACTIVITIES	SUMP*	ACTIVITY SUMMARY**
369	Shop Service		Building title suspect. Large oil stain (40' X 20').

NOTES:

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 20.
Activities Occurring at Suspect Sites Within Storm Drainage Area J
Site Inspection Work Plan: Underground Utilities

Building Number / IR Site Number	ACTIVITIES	SUMP*	COMMENTS**
307	Electronic Assembly		Building title suspect, oil leaks on concrete floor, machinery leaking oil, floor cracked in places. Drums stored outside with oil, drip pan to contain leaks.
383	Title Undetermined		Possible SOCs in soil.

* Source: ERM West, 1988, unless otherwise indicated
** Source: U.S. Navy, 1991, unless otherwise indicated
# Source: HLA site visit - February 25 through 26, 1991
Based on HLA observations, sump may not be present

Table 21.
Rationale for Proposed Tasks, Storm Drain System
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Storm Drain Sediment Sampling	Entire Storm Drain System	Evaluate the chemistry of sediments within the storm drain system and locate areas of contamination within the system.
Task 2 Storm Drain System Integrity Verification	Areas identified during Task 1	Locate areas where the physical integrity of the system is compromised.
Task 3 Soil Investigation adjacent to storm drain system	Areas identified during Task 2	Evaluate soil chemistry adjacent to the storm drain lines in areas of suspected release.

Table 22.
Rationale for Proposed Tasks, Sanitary Sewer System
Site Inspection Work Plan: Underground Utilities

Activity	Area	Rationale
Task 1 Sanitary Sewer System Inspection	Entire Sanitary Sewer System	Locate areas displaying apparent industrial contamination and generate an accurate map of the sanitary sewer system.
Task 2 Sanitary Sewer System Hydrogeologic Characterization and Sampling Point Identification	Entire Sanitary Sewer System	Evaluate hydrogeologic effects of the sanitary sewer system and identify sampling locations.
Task 3 Groundwater and Sanitary Sewer Water Sampling	Locations identified during Task 2	Generate a chemical data set to evaluate the chemical impact of the sanitary sewer system on the adjacent hydrogeology.

Table 23.
Sample Container, Handling, and Preservation Protocols for Groundwater and Soil Samples
Site Inspection Work Plan: Underground Utilities

Sample Matrix	Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Water/Oil	CLP VOCs	40 mL or 125 mL glass vial, Teflon-back septum	Two (2) or Three (3); vials filled completely, no air space	Cool to 4°C (ice in cooler) HCl to pH <2	10 days[1]
Water/Oil	CLP SOCs, CLP PCBs/Pesticides	1 liter amber glass bottle with Teflon-lined cap	Two (2); bottles are filled	Cool to 4°C (ice in cooler)	Extract within 5 days; analyze within 40 days[1]
Water/Oil	Priority Pollutant Metals plus barium, cobalt, molybdenum, and vanadium using CLP methods	1 liter polyethylene bottle	One (1); bottle is filled	Nitric Acid to below pH of 2 (approximately 2 mL concentrated HNO_3 per liter after field filtering with 0.45 micron filter); cool to 4°C (ice in cooler)	6 months [26 days for mercury][1]
Water	Hexavalent Chromium	250 mL polyethylene bottle	One (1); bottle is filled	Cool to 4°C (ice in cooler)	24 hours
Water	CLP Cyanide	1 liter polyethylene bottle	One (1); bottle is filled	NaOH to pH>12; Cool to 4°C (ice in cooler)	12 days[1]
Water/Oil	TPH as gasoline	40 mL or 125 mL glass vial, Teflon-back septum	Two (2) or Three (3); vials filled completely, no air space	Cool to 4°C (ice in cooler) HCl to pH <2	14 days[2]
Water/Oil	TPH as diesel	1 liter amber glass bottle with Teflon-lined cap	Two (2); bottles are filled	Cool to 4°C (ice in cooler)	Extract within 7 days, analyze within 40 days
Water/Oil	Total Recoverable Petroleum Hydrocarbons	1 liter amber glass bottle with Teflon-lined cap	Two (2); bottles are filled	Cool to 4°C (ice in cooler) H_2SO_4 to below pH of 2	28 days
Water	Fecal Coliform	1 liter glass	Two (2); bottles are filled	Cool to 4°C (ice in cooler)	24 hours

Table 23.
Sample Container, Handling, and Preservation Protocols for Groundwater and Soil Samples
Site Inspection Work Plan: Underground Utilities
(continued)

Sample Matrix	Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Soil/Sediment	CLP VOCs, TPH Gasoline	Air-tight completely full brass or stainless steel 4- or 6-inch long, 2 or 2.5-inch diameter tube or acid-washed 400g mason jar	One (1)	Cool to 4°C (ice in cooler)	10 days for VOCs[1] 14 days for TPH
Soil/Sediment	CLP SOCs, CLP PCBs/ Pesticides	Air-tight completely full brass or stainless steel 4- or 6-inch long, 2 or 2.5-inch diameter tube or acid-washed 400g mason jar	One (1)	Cool to 4°C (ice in cooler)	Extract within 10 days; analyze within 40 days[1]
Soil/Sediment	TPH Diesel	Air-tight completely full brass or stainless steel 4- or 6-inch long, 2 or 2.5-inch diameter tube or acid-washed 400g mason jar	One (1)	Cool to 4°C (ice in cooler)	Extract within 14 days, analyze within 40 days
Soil/Sediment	Total Recoverable Petroleum Hydrocarbons	Air-tight completely full brass or stainless steel 4- or 6-inch long, 2 or 2.5-inch diameter tube or acid-washed 400g mason jar	One (1)	Cool to 4°C (ice in cooler)	28 days

Table 23.
Sample Container, Handling, and Preservation Protocols for Groundwater and Soil Samples
Site Inspection Work Plan: Underground Utilities
(continued)

Sample Matrix	Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
Soil/Sediment	Priority Pollutant Metals plus barium, cobalt, molybdenum and vanadium using CLP methods, CLP Cyanide, pH	Acid-washed 400g mason jar or air-tight completely full brass or stainless steel 4 or 6-inch long 2 or 2.5 inch diameter tube	One (1)	Cool to 4°C (ice in cooler)	6 months, (26 days for Mercury, 12 days for cyanide, ASAP for soil pH)[1]
Soil/Sediment	Hexavalent Chromium	Acid-washed 400g mason jar or air-tight completely full brass or stainless steel 4 or 6-inch long 2 or 2.5 inch diameter tube	One (1)	NA	24 hours
Soil	Asbestos	Approximately 50 ml plastic jar	One (1)	NA	NA

2 If groundwater samples effervesce with HCl preservation, HCl will not be added and the holding time will be 7 days.

1 Holding time for CLP analyses calculated from the validated time of sample receipt (VTSR), the date on which a sample is received at the laboratory.

ASAP Analyze as soon as possible.

NA Not applicable.

Table 24.
Proposed Field QC Samples
Site Inspection Work Plan: Underground Utilities

Proposed Analysis	Equipment Blanks	Field Blanks	Trip Blanks
CLP VOCs	12	9	10
CLP SOCs	12	9	0
CLP PCBs/Pesticides	12	9	0
Priority Pollutant Metals, including barium, cobalt, molybdenum and vanadium	12	9	0
Hexavalent Chromium EPA Method 7196, SW-846	8	5	0
CLP Cyanide	8	5	0
TPH Gasoline[1] DHS Test Method, LUFT Manual	12	9	0
TPH Diesel[1] DHS Test Method, LUFT Manual	12	9	0
Total Recoverable Petroleum Hydrocarbons EPA Test Method 418.1	12	9	0
Fecal Coliform Standard Methods 9221C	5	5	-
pH	12	-	-

1 Leaking Underground Fuel Tank (LUFT) Field Manual, October 1989, Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure, State of California, Leaking Underground Fuel Tank Task Force.

Table 25.
Required Laboratory QC Samples
Site Inspection Work Plan: Underground Utilities

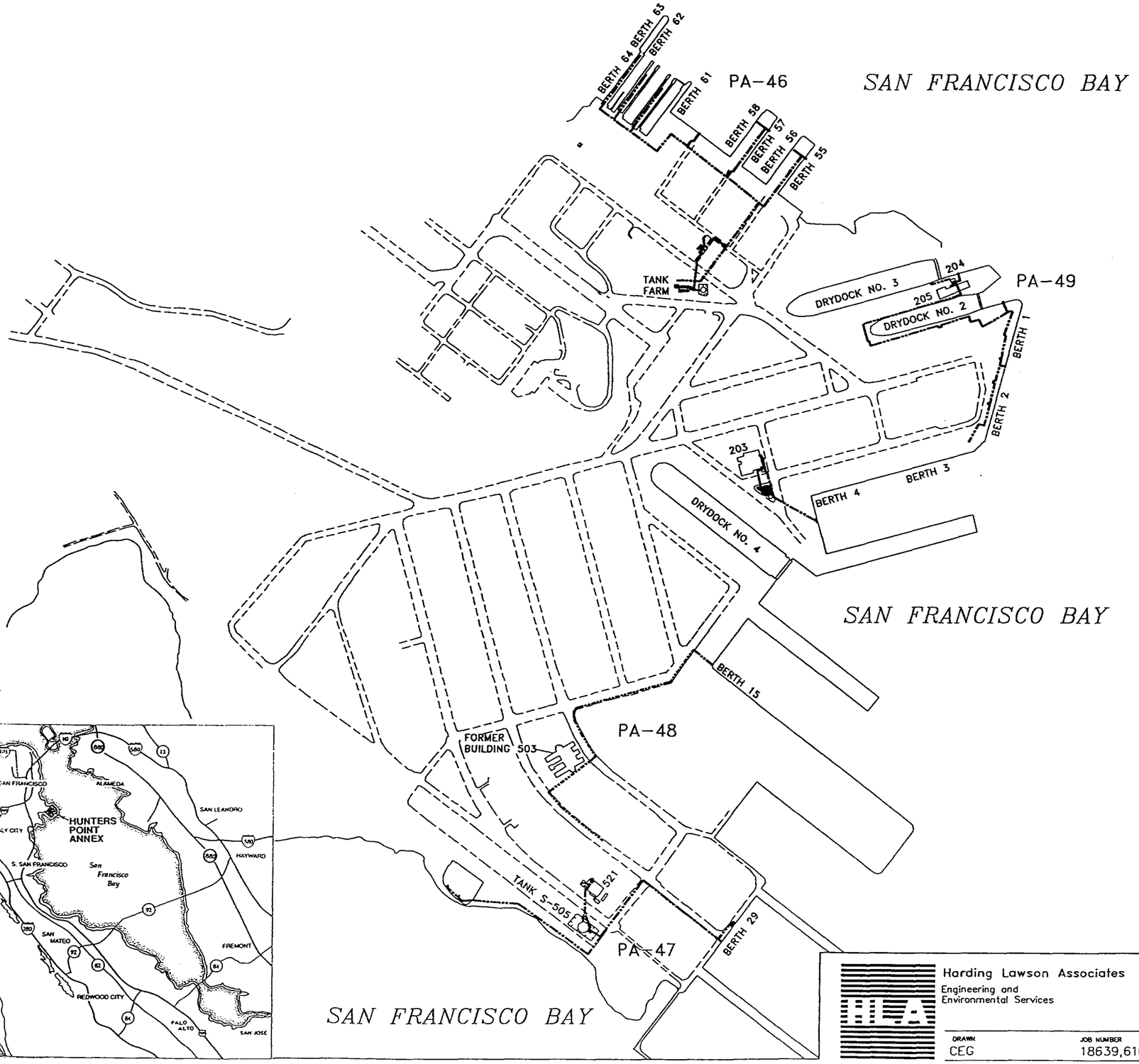
Analysis	Method Blank	Matrix Duplicate	Matrix Spike	Matrix Spike Duplicate	Blank Spike	Surrogate Spike
CLP VOCs	R[1]	--[2]	R	R	--	R
CLP SOCs	R	--	R	R	--	R
CLP Pest./PCBs	R	--	R	R	R	R
Priority Pollutant Metals including barium, cobalt, molybdenum and vanadium	R	R	R	--	R	--
Chromium VI	R	R	R	--	R	--
CLP Cyanide	R	R	R	--	R	--
TPH, as gasoline	R	--	R	R	R	--
TPH, as diesel	R	--	R	R	R	--
Total Recoverable Petroleum Hydrocarbons	R	R	R	--	R	--
Fecal Coliform	R	R	--	--	--	--

1 R = Required; minimum frequency is 1/20 samples. However, frequency of laboratory QC samples is dependent on the frequency of submittal and analysis; see CLP SOW and NACIP manual for specifics on frequency of laboratory QC analysis.

2 -- = Not required.

ILLUSTRATIONS

24344



SITE#	AREA DESIGNATIONS
PA-46	Fuel Distribution Lines, Tank Farm
PA-47	Fuel Distribution Lines, Tank S505
PA-48	Suspected Steamlines Building 503
PA-49 Buildings	Fuel Distribution Lines, 203 and 205

---------- Chemical Lines

———————— Fuel Lines

N

0 700

SCALE IN FEET

HPAN0057 700.0
19920326.0814

Harding Lawson Associates
Engineering and Environmental Services

Site Location Map
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPE	10/91	

EXPLANATION

IR09B036 — Existing Boring Adjacent to the System

IR09PPY1 — Existing Monitoring Well Adjacent to the System

Approximate System Access Location

Steamline Sample Location

Steamline

LOCATION OF SAMPLE SP-STM-1

ACCESS HOLE WHERE FREE PRODUCT WAS OBSERVED

APPROXIMATE LOCATION OF BROKEN STEAMLINE

PIPE CUT (OIL INSIDE PIPE)

IR09B028
IR09B027
IR09B006
IR09B005
IR09B008
IR09PPY1
IR08B036
IR17MW13A
IR17MW12A
IR02B195
IR02MW196A

DRYDOCK NO. 4
SOUTH PIER
REGINNING PIER
PARKING
AVE.
ST.

0 200 400
SCALE IN FEET

Harding Lawson Associates
Engineering and Environmental Services

Steamlines: Southern Portion of Site (PA-45)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BBF	10/91	

HPAN0042 400.0
19920325.1721

EXPLANATION

IR06B037 — Existing Boring Adjacent to the System

IR06MW30A — Existing Monitoring Well Adjacent to the System

Approximate System Access Location

Steamline Sample Location

Steamline

India Basin

SUBBASE AREA

P-2

IR07MWP-2

P-C

IR07MWP-1

P-B

PREVIOUS LOCATION OF BUILDING 124

IR06B038

IR06B037

IR06MW30A

IR06B039

IR06MW27A

IR06MW32A

IR06B014

TANK FARM

7

6

LOCKWOOD ST.

ENGLISH ST.

ROBINSON ST.

GALVEZ AVE.

HUDSON AVE.

INNES AVE.

DONAHUE ST.

COLEMAN ST.

JERROLD AVE.

FISHER AVE.

SPEAR AVE

VAN REIPEN AVE.

NIMITZ AVE.

BLANDY ST.

DRYDOCK NO. 4

NORTH PIER

NORTH BERTHING SLIP

PT. Avisadero

0 200 400

SCALE IN FEET

HPAN0056 400.0
1928020325.1713

Harding Lawson Associates
Engineering and Environmental Services

Steamlines: Northern Portion of Site (PA-45)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEGc	18639,616.02	BOF	10/91	

EXPLANATION

- Proposed Trench Location
- IR06B038 — Existing Soil Boring Adjacent to Fuel Line
- IR06MW32A — Existing Monitoring Well Adjacent to Fuel Line
- Approximate Location of Fuel Line
- Suspected Fuel Line Location

BERTH 63
BERTH 62
BERTH 64
DRYDOCK NO. 7
DRYDOCK NO. 6
DRYDOCK NO. 5
BERTH 61
BERTH 58
BERTH 57
BERTH 56
BERTH 55
LOCATION OF FORMER BERTH 60
LOCATION OF BREAK IN FUEL DISTRIBUTION LINE
S-146
SUBBASE AREA
LOCKWOOD ST.
ROBINSON ST.
SULPHURIC ACID STORAGE TANK
DISTILLED WATER STORAGE TANKS
ELECTROLYTE STORAGE TANKS
TANKS
TANK FARM IR-6
IR06MW44
IR06B038
IR06MW32A
IR06B036
IR06B026
IR06B037
IR06B024
IR06B025
IR06MW23A
IR06B010
129
132
133
131
130
163
156
159
128
155
125
134
144
123
122
146
121
119
120
113
113A
112
111
N
0 75 150
SCALE IN FEET

Harding Lawson Associates
Engineering and Environmental Services

Fuel Distribution Lines, Tank Farm (PA-46)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639.616.02	[illegible]	10/91	

HPANO043 150.0
19920326.1032

HUSSEY ST.
PIER 1
BERTH 28
414
MANSEAU ST.
502
501
503
508
512
513
514
517
516
509
507
515
530
523
525
526
MAHAN ST.
FUEL OIL RECEIVING STATION
BERTH 29
500
522
403
"H" ST.
519
505
505
506
510A
510
511
511A
"I" ST.
803
524
518
520
STORAGE TANKS
521
BERTH 30
PIER 2
BERTH 35
"J" ST.
IR02B195
IR02MW196A
TANK S-505
TANK
IR02B202
"K" ST.
BERTH 36
IR02MW209A
IR02MW206A1
IR02MW206A2
IR02B207
OIL RECLAMATION POND (IR-3)
IR03B223
IR03MW0-2
LOCATION OF CUT AND CAPPED PIPELINE
N
0 75 150
SCALE IN FEET

EXPLANATION

- Proposed Trench Location
- IR02B207 — Approximate Location of Borings and Sampling Location
- IR02MW209A — Approximate Location of Wells and Sampling Location
- Approximate Location of Fuel Line

HPANN0044 150.0
1992/03/25 12:44

Harding Lawson Associates
Engineering and Environmental Services

Fuel Distribution Lines, Tank S-505 (PA-47)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BAF	10/91	

EXPLANATION

- Approximate Location of Suspected Steamlines
- Approximate Location of Mapped Steamlines
- Approximate Location of Cut Steamline which Contains Oil
- Existing Soil Boring Adjacent to Suspected Steamline
- Existing Monitoring Well Adjacent to Suspected Steamline

414
439
411
803
522
500
519
TENNIS COURT
505
505
403
"J" ST.
"H" ST.
MANSEAU ST.
501
502
410
408
438
409
COCHRANE ST.
351
351A
364
365
323
324
PRIOR GREASE TRAP
FORMER FUEL STORAGE TANK LOCATION
503
PRIOR GREASE TRAP
IR08B035
IR08B001
IR08B019
IR08B006
IR08B013
IR08MW41A
IR08B009
IR08B007A
IR08B036
507
508
518
510A
509
517
510
512
HUSSEY ST.
516
TANKS
511
513
307
REGUNNING PIER
BERTH 15
N
0 75 150
SCALE IN FEET

HPAN0045 150.0
19920325.1700

HARDING LAWSON ASSOCIATES
Engineering and Environmental Services

Suspected Steamlines, Bldg. 503 (PA-48)
Site Inspection Work Plan: Underground Utilities
Hunters Point annex
San Francisco, California

PLATE **6**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CSN	18639.616.02	BPE	11/91	

EXPLANATION

Approximate Fuel Line Location

Proposed Trench Location

Pt. Avisadero

TANK S-214

BERTH 1

BERTH 2

BERTH 3

"A" ST.

DRYDOCK NO. 2

DRYDOCK NO. 3

SPEAR AVE.

NIMITZ AVE.

LOCKWOOD ST.

LOCKWOOD ST.

201

204

205

207

208

206

214

218

219

231

211

224

225

253

226

228

252

251

140

142A

141

157

163

156

135

0 75 150

SCALE IN FEET

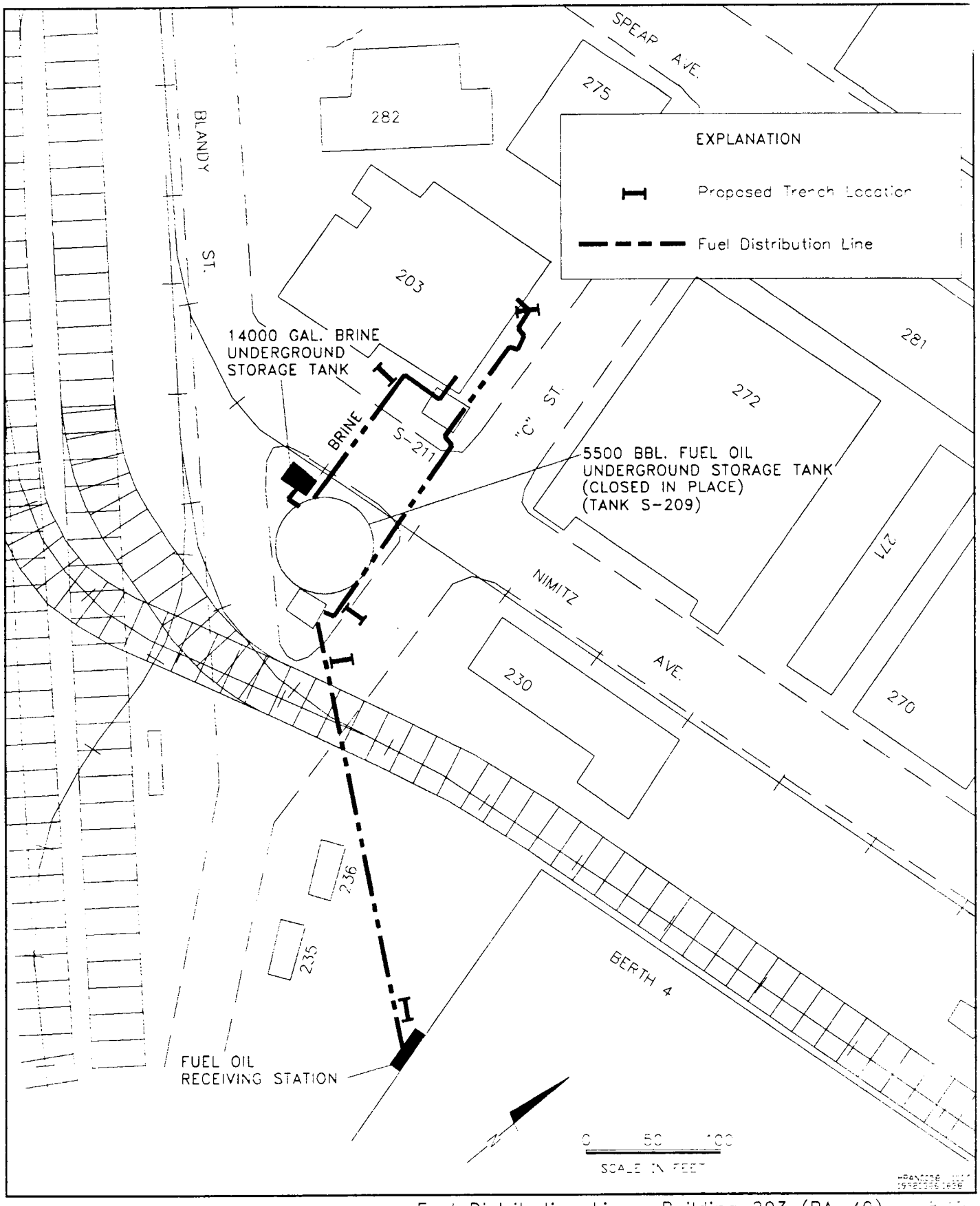
HPAN0046 150.0
19920325.1206

Harding Lawson Associates
Engineering and
Environmental Services

Fuel Distribution Lines, Building 205 (PA-49)
Site Inspection Work Plan: Undergroundd Utilities
Hunters Point Annex
San Francisco, California

PLATE 7

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPF	10/91	

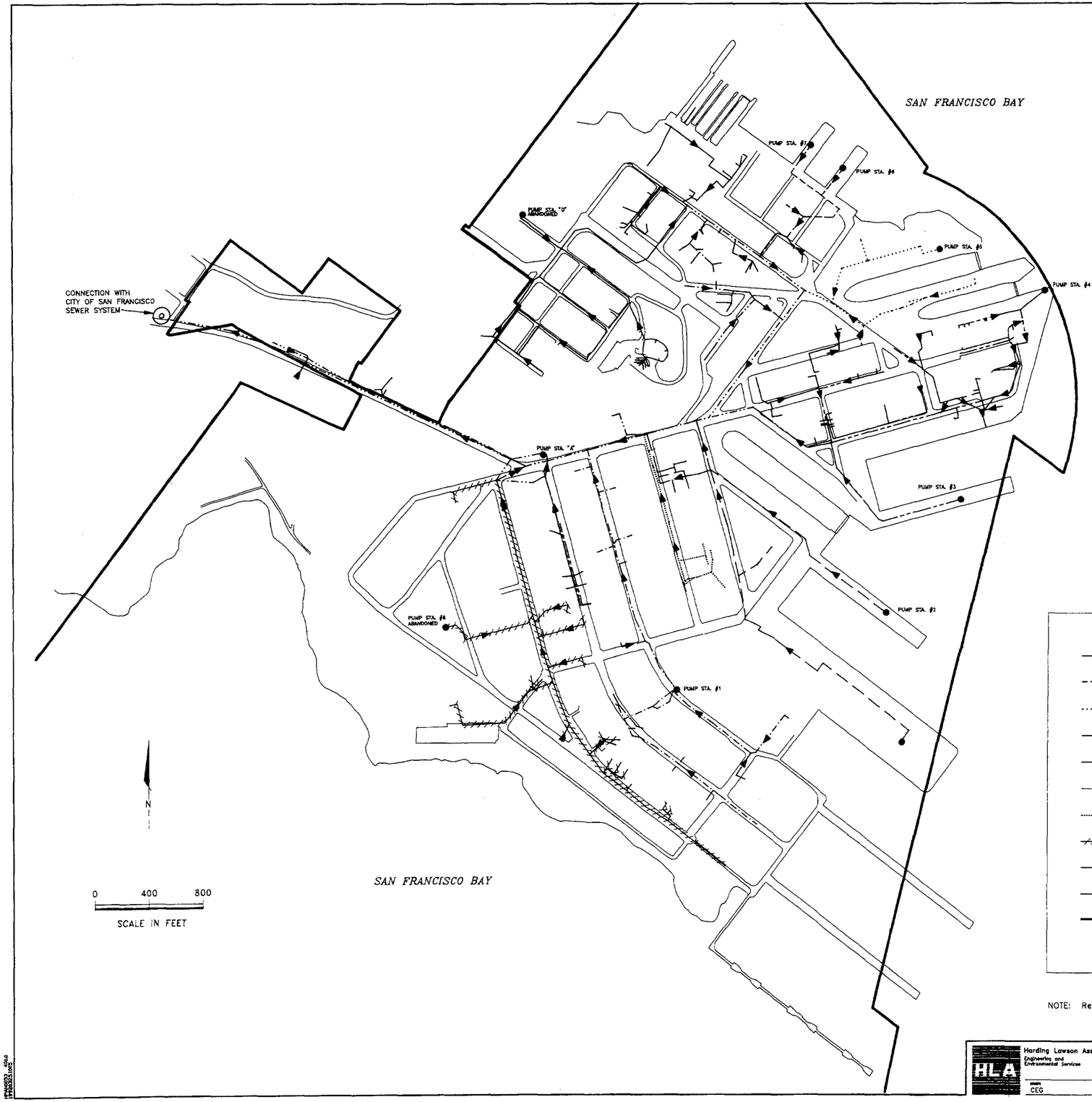


Harding Lawson Associates
Engineering and
Environmental Services

Fuel Distribution Lines, Building 203 (PA-49)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639.616.02	BDF	10/9/	



NOTE: Reaches and sanitary sewer locations from YEI, 1988b.

Harding Lawson Associates
Engineering and Environmental Services

Sanitary Sewer Reaches
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	GPR	12/91	

24799

EXPLANATION

- System Access Point
- Pump Station
- Sanitary Sewer Line
- Abandoned Sanitary Sewer Line
- IR06B038 — Existing Soil Boring Adjacent to System
- IR06MW41A — Existing Monitoring Well Adjacent to System

0 150 300

SCALE IN FEET

India Basin

Pt. Avisadero

PUMP STA. #7

PUMP STA. #6

PUMP STA. #5

PUMP STA. #4

PUMP STA. #3

PUMP STA "D" ABANDONED

NORTH PIER

NORTH BERTHING SLIP

DRYDOCK NO. 2

DRYDOCK NO. 3

DRYDOCK NO. 4

DRYDOCK NO. 5

DRYDOCK NO. 6

DRYDOCK NO. 7

BERTH 1

BERTH 2

BERTH 3

BERTH 4

BERTH 5

BERTH 6

BERTH 7

BERTH 8

BERTH 9

BERTH 55

BERTH 56

BERTH 57

BERTH 58

BERTH 61

BERTH 62

BERTH 63

BERTH 64

IR07MW19A

IR07B018

IR07MWP-2

IR07MWP-1

IR10B001

IR10B002

IR10MW12A

IR10B005

IR10B006

IR06MW40A

IR10B007

IR10B008

IR10B027

IR06MW41A

IR06B038

IR06MW34A

IR06MW42A

IR06B043

IR06MW30A

IR06B033

IR06B039

IR06MW23A

IR06B024

IR06B014

LOCKWOOD ST.

ROBINSON ST.

GALVEZ AVE.

HUDSON AVE.

INNES AVE.

JERROLD AVE.

DONAHUE ST.

COLEMAN ST.

ENGLISH ST.

HORNE AVE.

FISHER AVE.

SPEAR AVE.

NIMITZ AVE.

VAN REYPEN AVE.

BLANDY ST.

"D" ST.

C ST.

A ST.

HPAN0055 300.0
05220325.1142

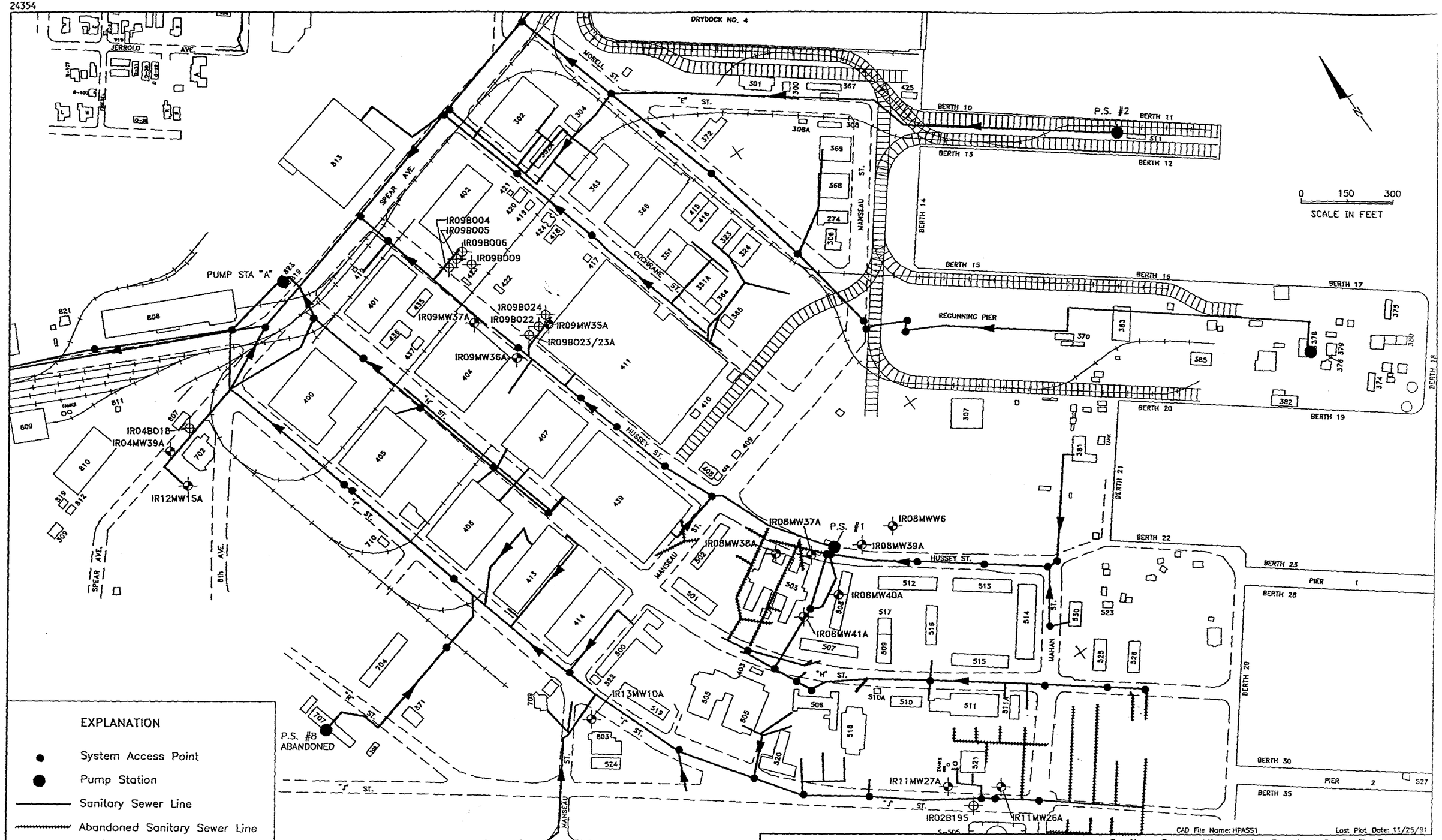
Harding Lawson Associates
Engineering and Environmental Services

Sanitary Sewer Alignments: Reaches 1,2,3,4, and 10 (partial)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPE	10/91	

24354



EXPLANATION

- System Access Point
- Pump Station
- Sanitary Sewer Line
- Abandoned Sanitary Sewer Line
- IR09B006 — Existing Soil Boring Adjacent to System
- IR09MW37A — Existing Monitoring Well Adjacent to System

CAD File Name: HPASS1

Last Plot Date: 11/25/91

Harding Lawson Associates
Engineering and Environmental Services

Sanitary Sewer Alignments: Reaches 5, 6, 7, 8, 9, and 10 (partial)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **11**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BAF	11/91	

24355

EXPLANATION

- System Access Point
- Pump Station
- IR04B018 — Existing Soil Boring Adjacent to System
- IR04MW39A — Existing Monitoring Well Adjacent to System
- Sanitary Sewer Line

N

0 100 200
SCALE IN FEET

NAVY ROAD
CRISP AVE.
GRIFFITH ST.
DERRICK AVE.
FRIDGE
"A" ST.
"F" ST.
6th AVE.
PUMP STA "A"
TANKS
CONC.
R-118
R-95
R-107
R-100
R-111
0-24
0-30
0-23
0-36
906
919
821
819
823
815
808
818
805
816
817A
817
820
831
830
809
811
807
IR04B018
IR04MW39A
810
702
400
519
812
309
IR12MW15A

CAD File Name: HPASS5
Last Plot Date: 11/25/91

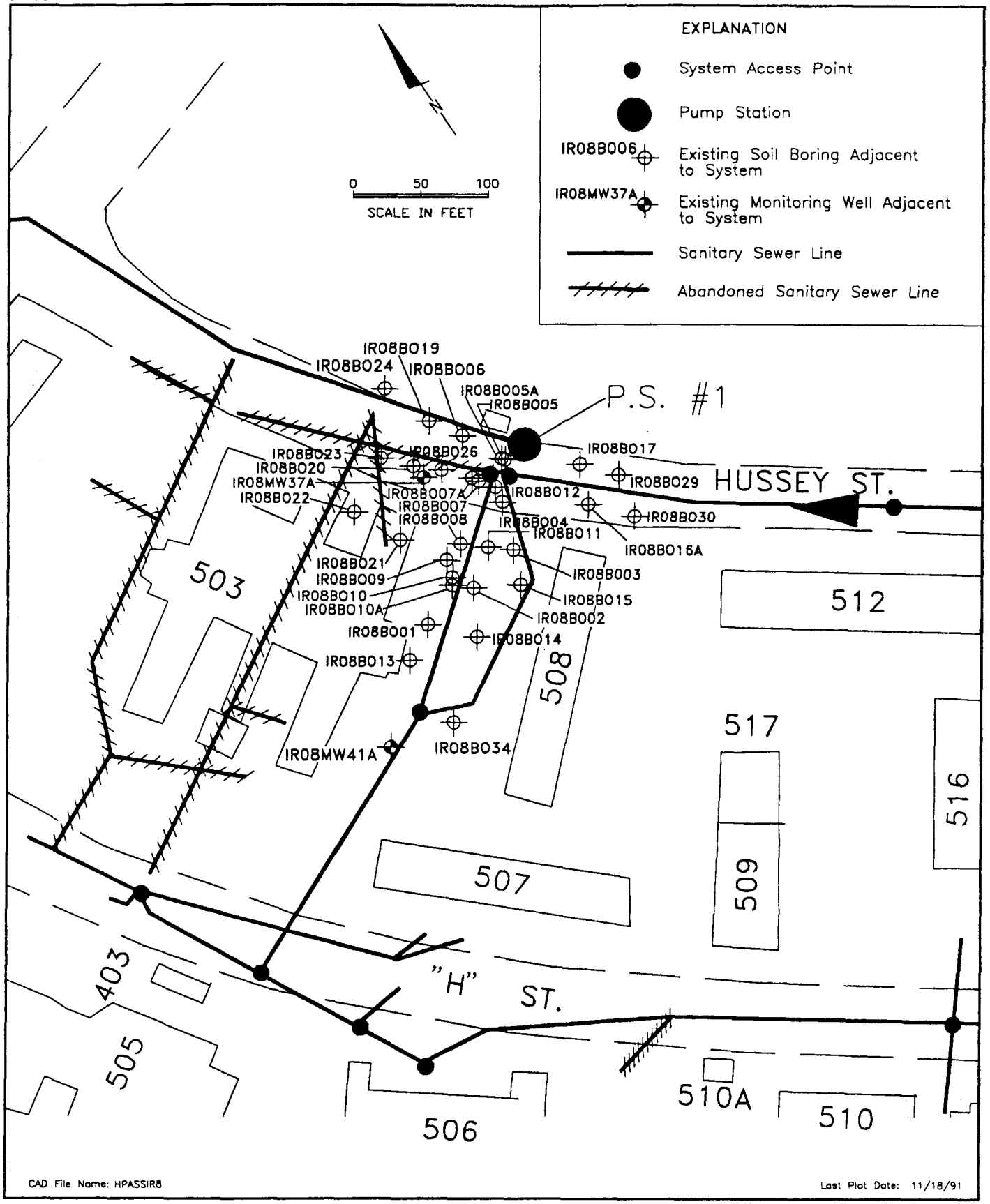
Harding Lawson Associates
Engineering and Environmental Services

Sanitary Sewer Alignments: Reach 10 (Partial)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 12

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED
CEG	18639,616.02	BPF	10/91	

24356



CAD File Name: HPASSIR8

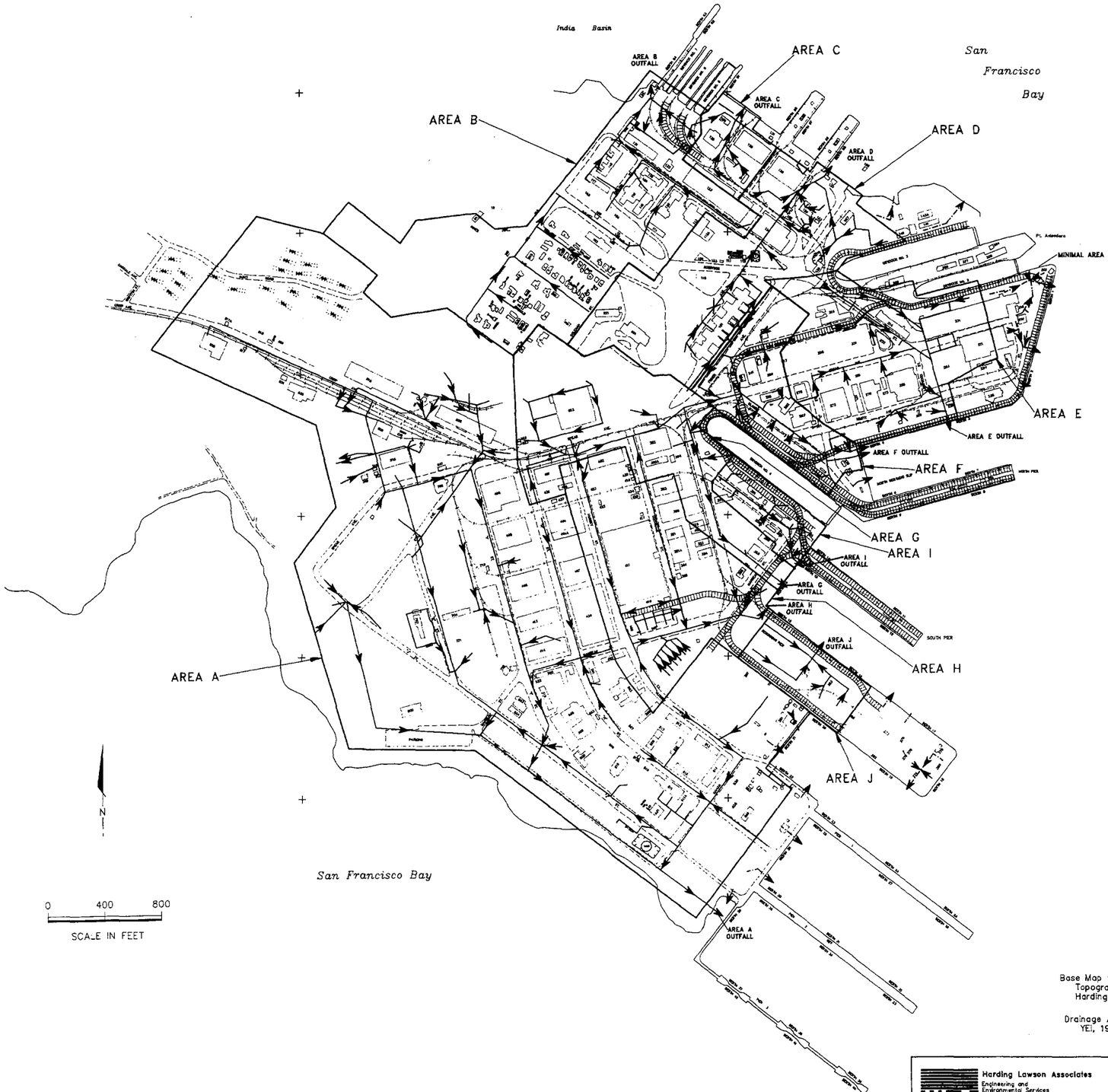
Last Plot Date: 11/18/91

Harding Lawson Associates
Engineering and Environmental Services

Sanitary Sewer Alignments: Reach 6 (partial)
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **13**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CEG	18639,616.02	BPE	11/91		



EXPLANATION

- Storm Sewer Drain Lines
- Minimal Drain System
- Boundaries of Drainage Areas

Base Map taken from:
Topographic and Geologic Map, Scoping Document
Harding Lawson Associates, 02/88

Drainage Areas and Storm Sewer Drain Lines from
YEI, 1988.

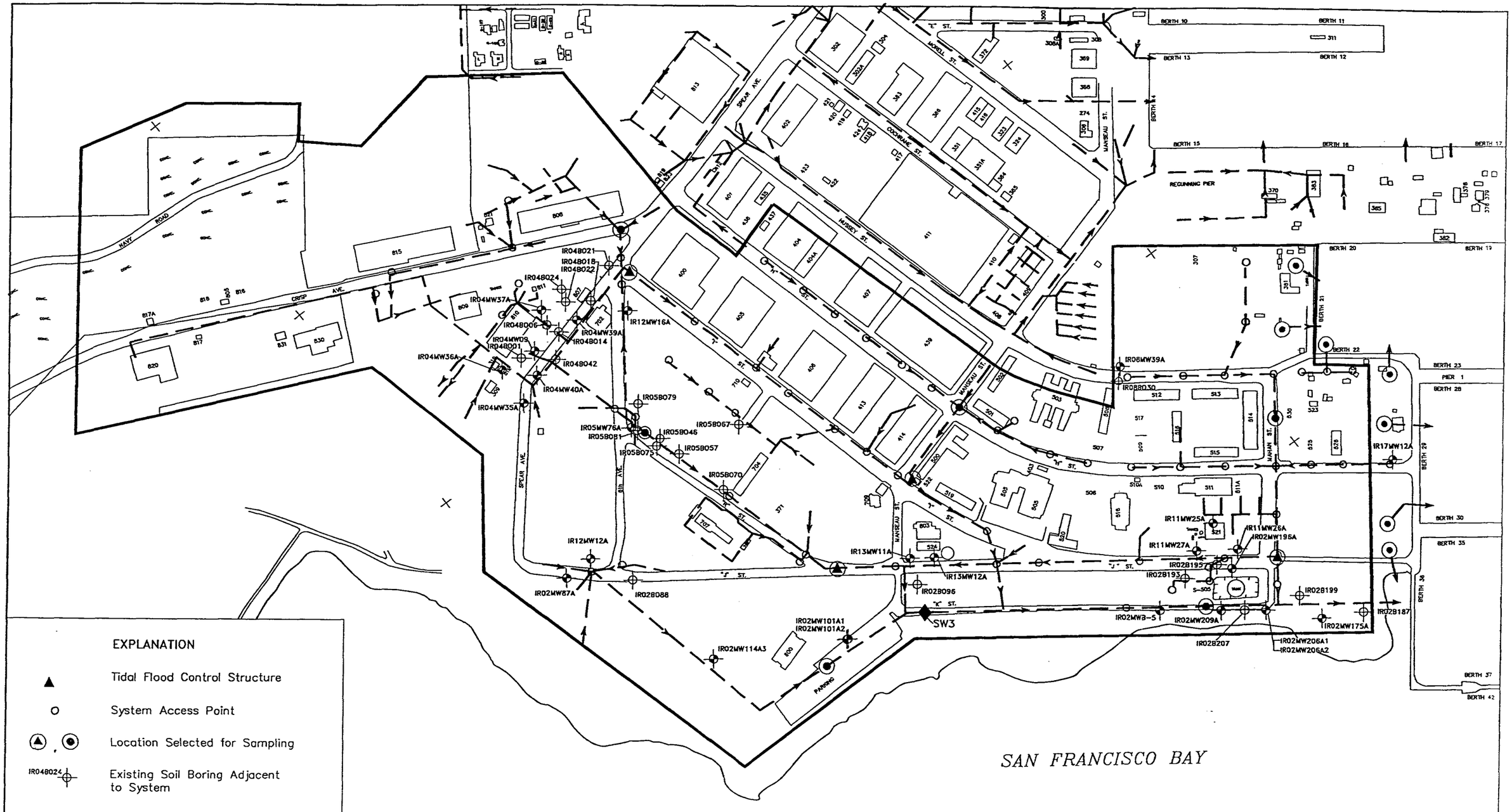
Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignment Location Map
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 14

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BEF	10/91	

24575



EXPLANATION

- Tidal Flood Control Structure
- System Access Point
- Location Selected for Sampling
- IR04B024 — Existing Soil Boring Adjacent to System
- IR04MW09 — Existing Monitoring Well Adjacent to System
- Approximate Location of Storm Drain Line
- Drainage Area Boundary
- Location of Previous Storm Drain Sampling (HLA, 1991b)

HPASW_A 400.0
19920318.1142

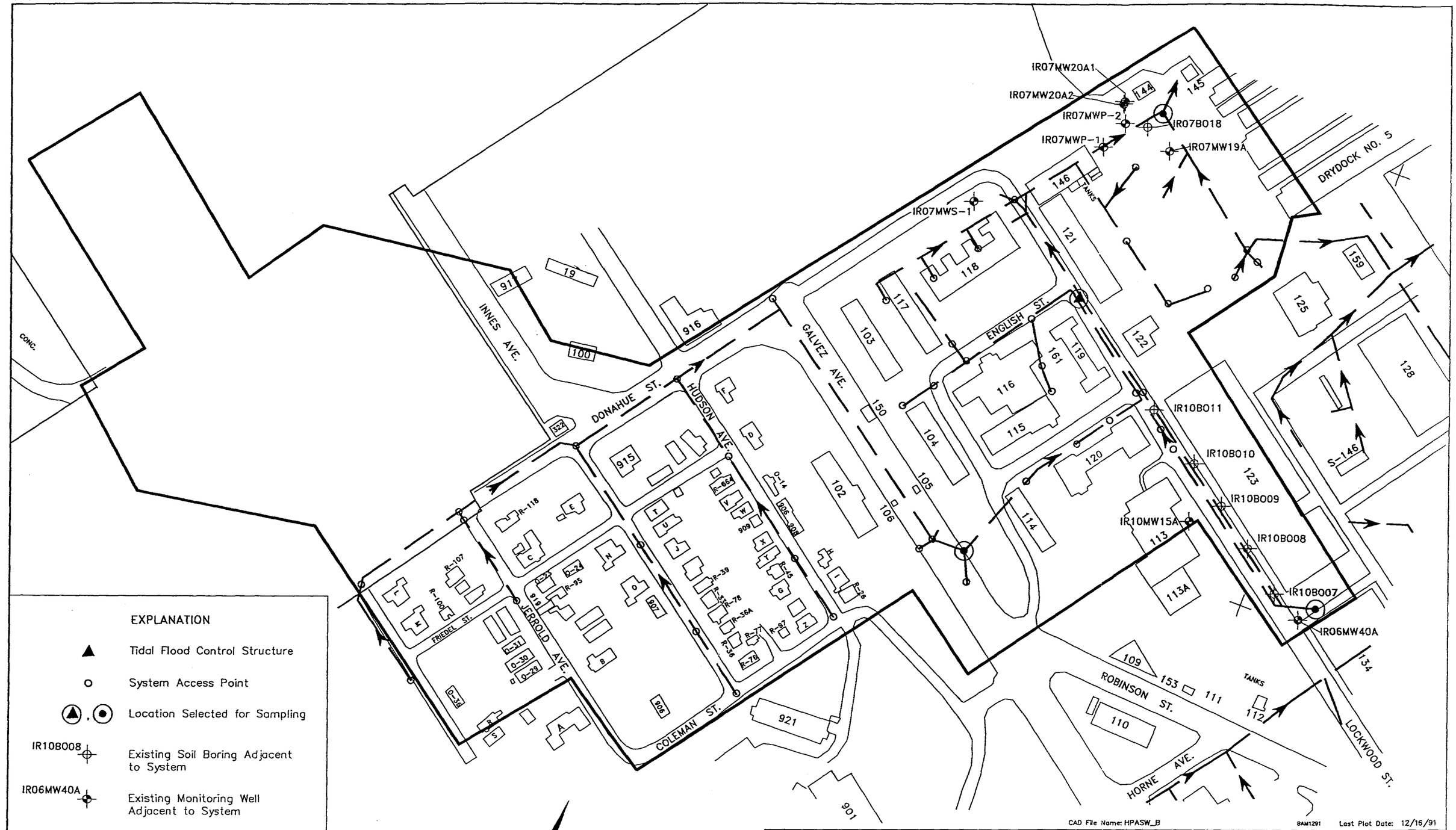
Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area A
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **15**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02		10/91	

24358



CAD File Name: HPASW_B 8AM1291 Last Plot Date: 12/16/91

Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area B
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 16

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPE	10/91	

24359

EXPLANATION

- System Access Point
- Location Selected for Sampling
- IR10B002 — Existing Soil Boring Adjacent to System
- IR10MW13A1 — Existing Monitoring Well Adjacent to System
- Approximate Location of Storm Drain Line
- Drainage Area Boundary

N

0 50 100
SCALE IN FEET

DRYDOCK NO. 5
BERTH 61
BERTH 58
BERTH 57
BERTH 56
BERTH 55
LOCKWOOD ST.
TANKS
S-146
IR10MW13A1
IR10MW13A2
IR10B002
IR10B003
121
122
123
125
128
130
131
132
133
144
145
159
129
161
119
116
115
120

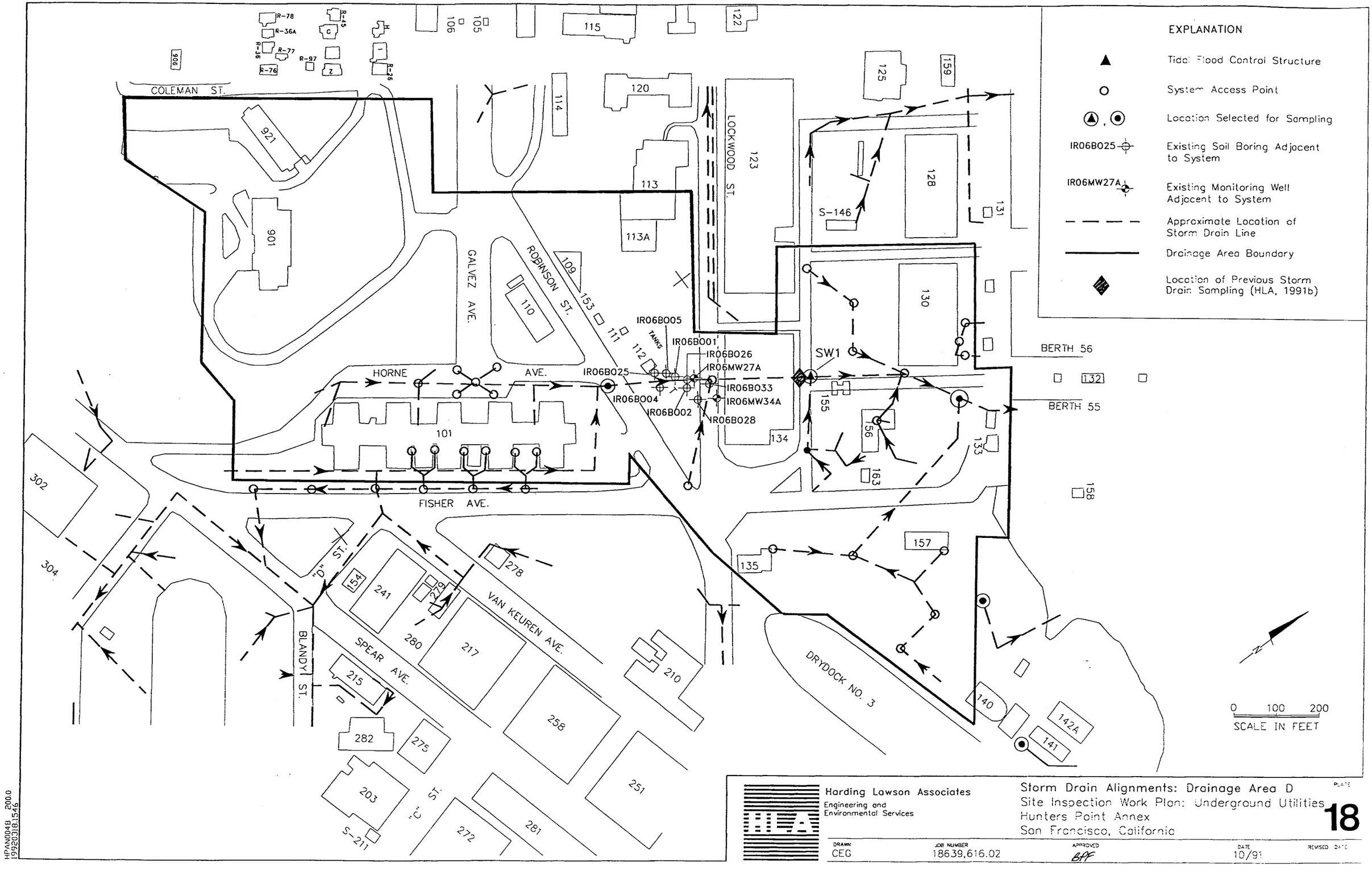
CAD File Name: HPASW_C
Last Plot Date: 11/19/91

Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area C
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 17

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPE	10/91	



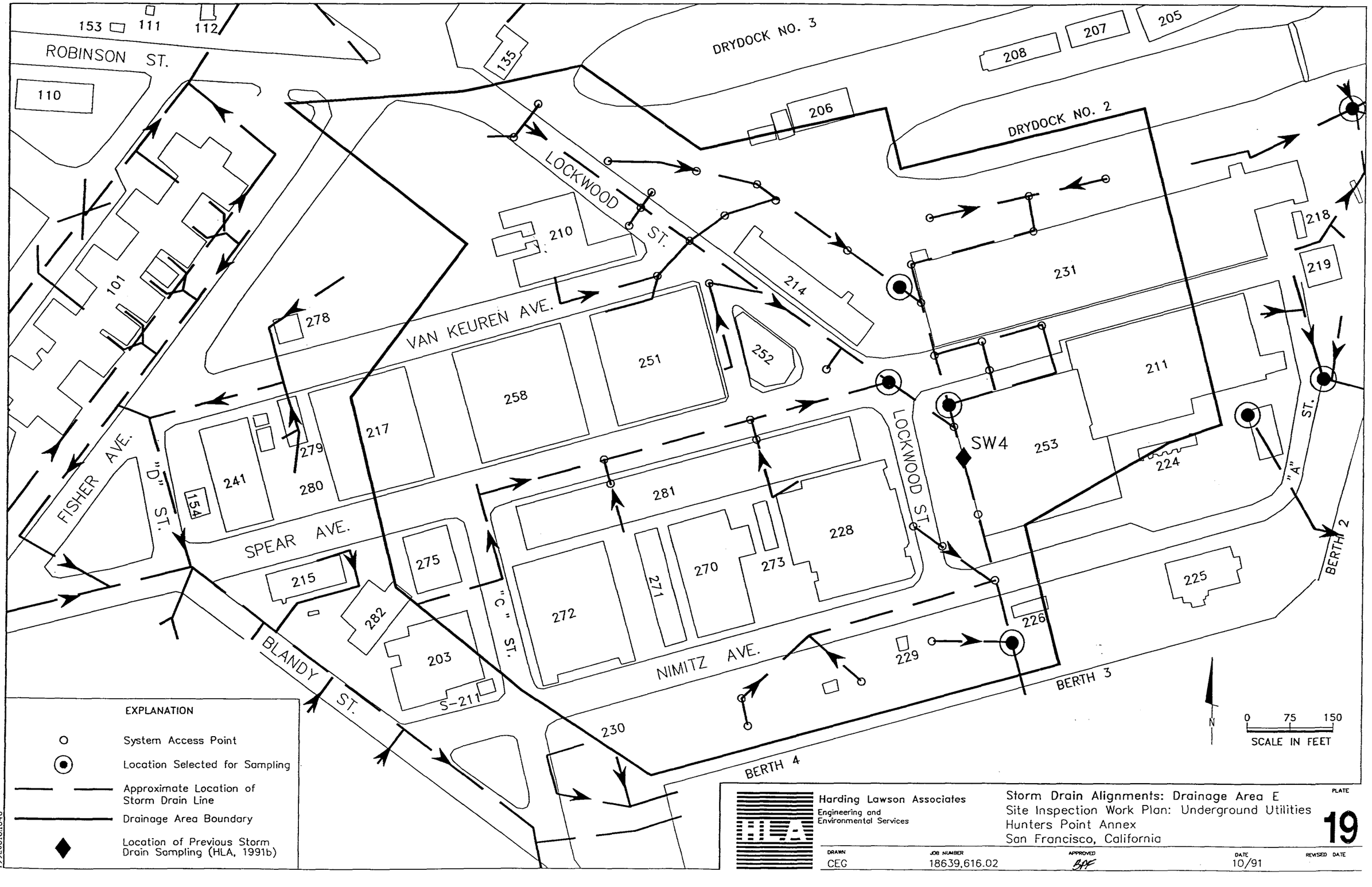
HPAN0048 200.0
19920318.1546

Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area D
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 18

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BJF	10/91	



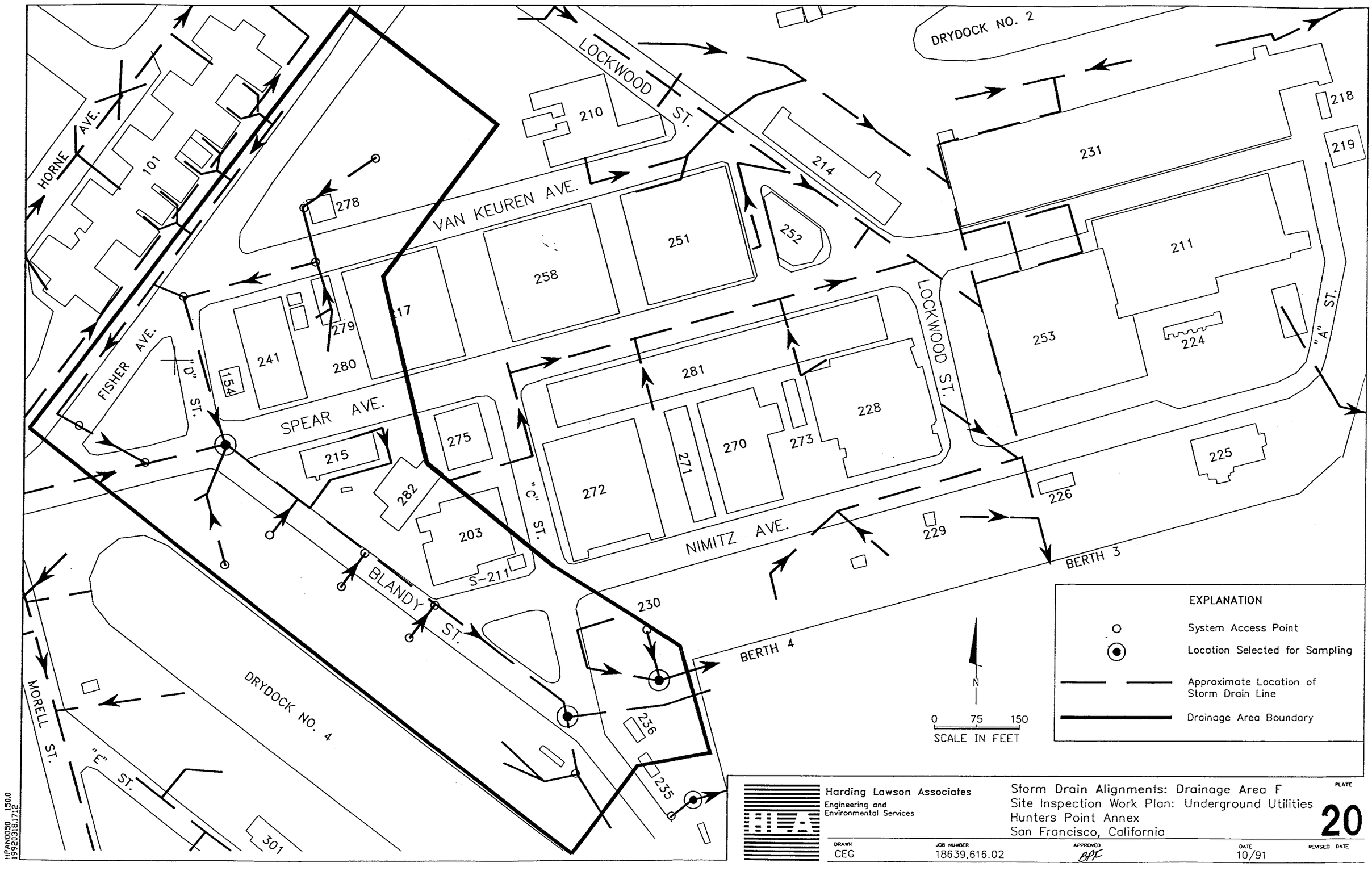
HPAN0049 150.0
19920318.1648

Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area E
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 19

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BAF	10/91	



HPAN0050 150.0
19920318.1712

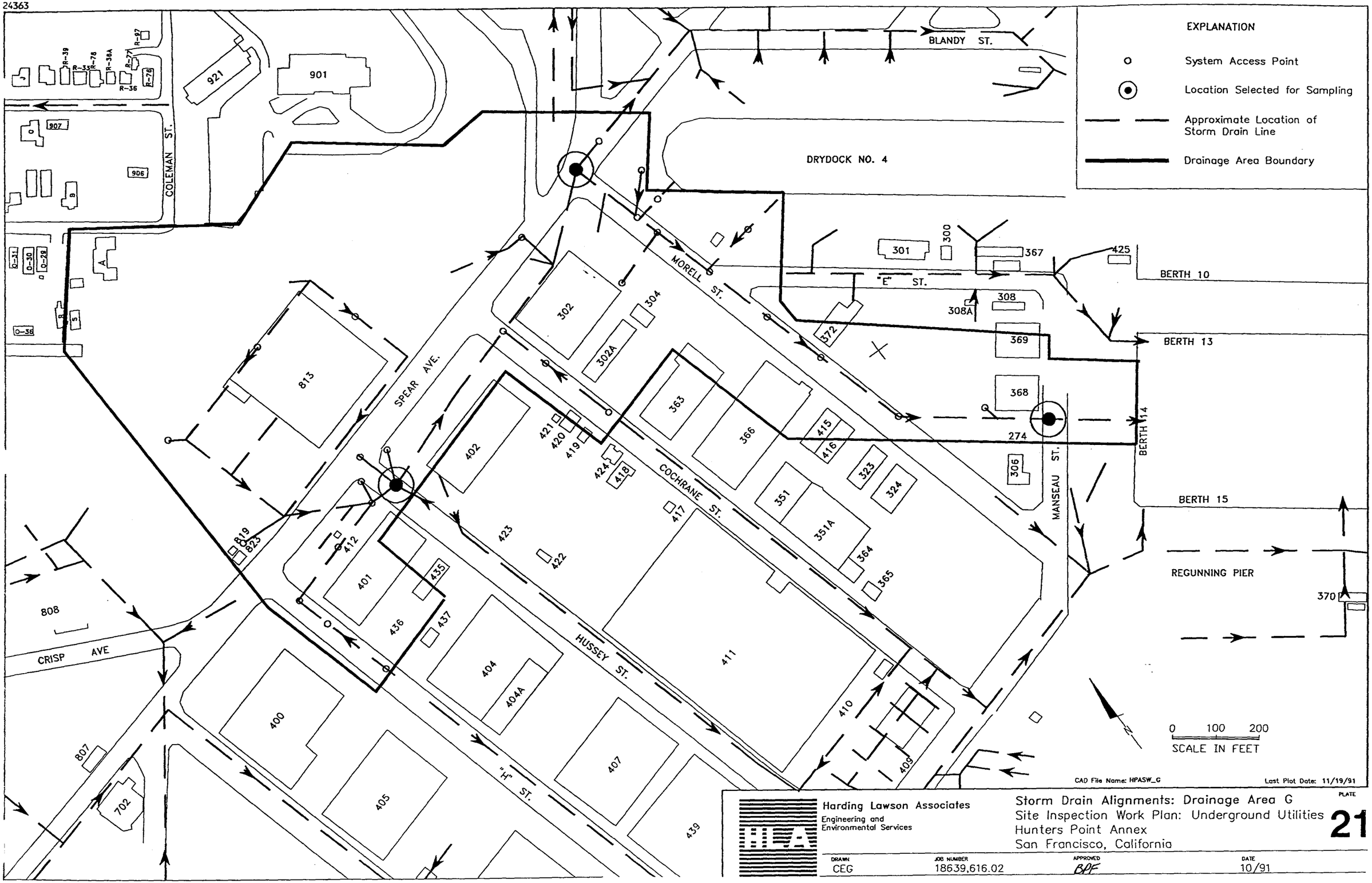
Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area F
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 20

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BPE	10/91	

24363



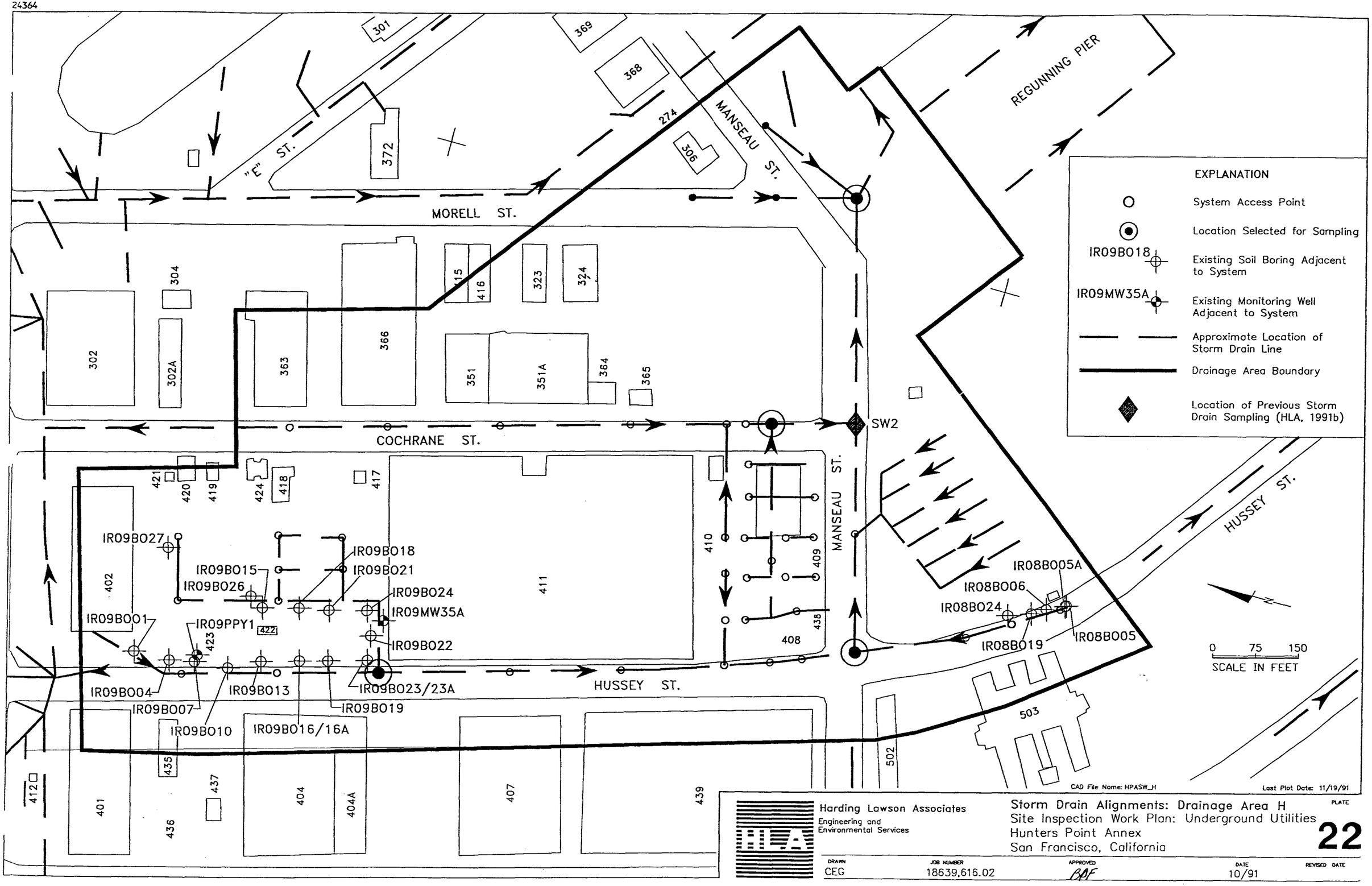
Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area G
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **21**

DRAWN	JOB NUMBER	APPROVED	DATE
CEG	18639,616.02	BPF	10/91

24364



CAD File Name: HPASW_H

Last Plot Date: 11/19/91

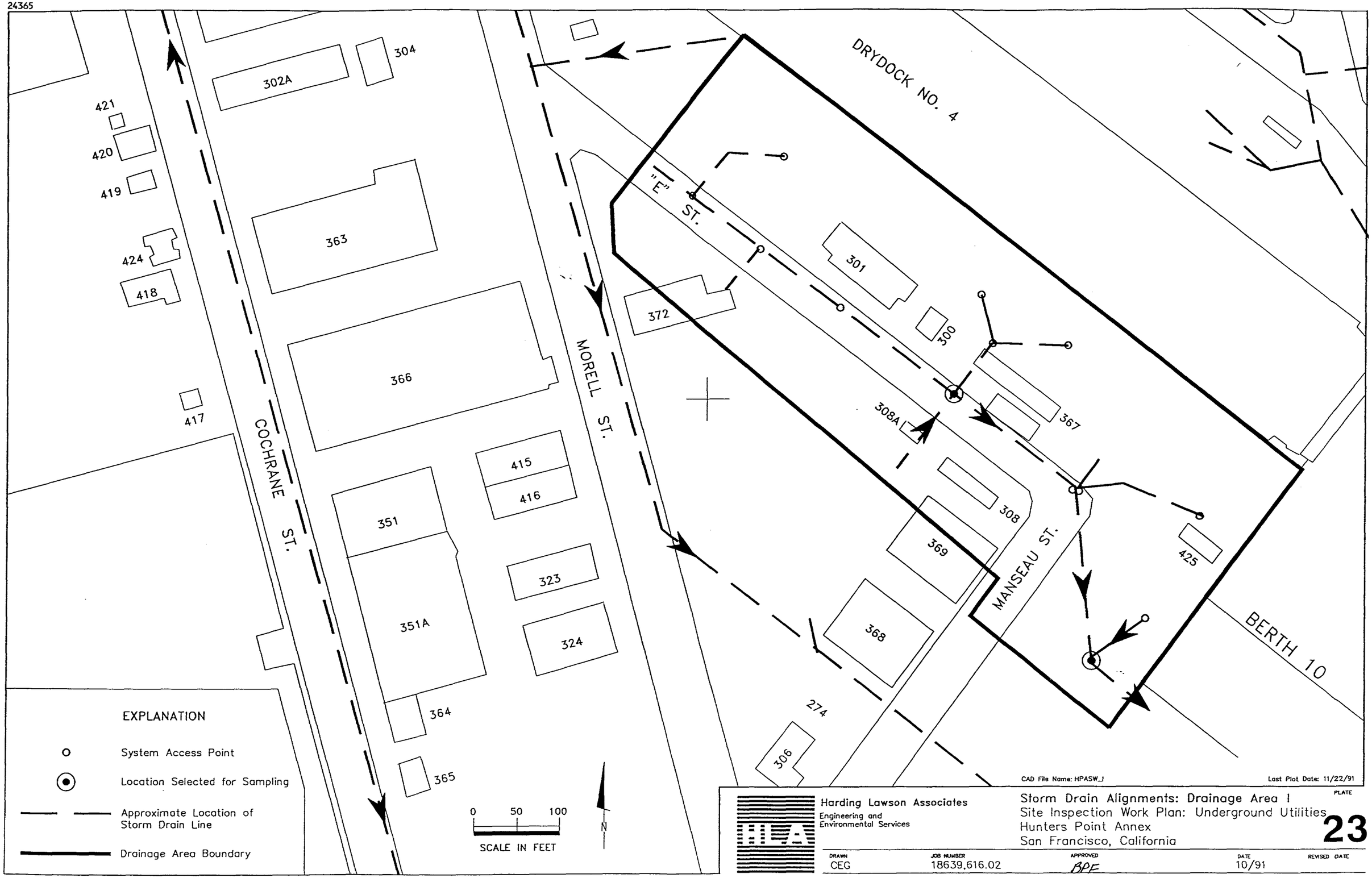
Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area H
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 22

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639,616.02	BAF	10/91	

24365



CAD File Name: HPASW_I

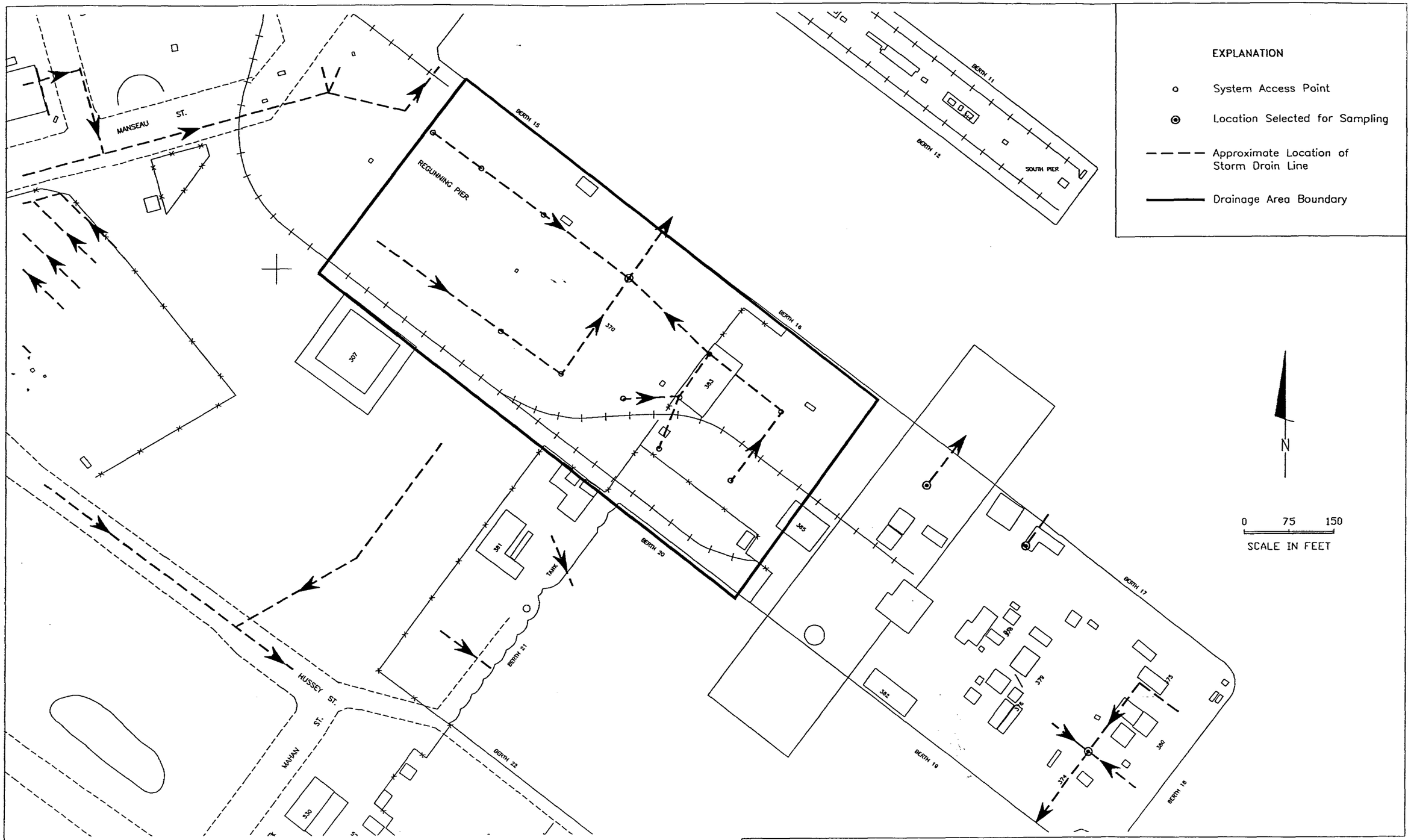
Last Plot Date: 11/22/91

Harding Lawson Associates
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area I
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE 23

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CEG	18639.616.02	BPE	10/91	



HARDING LAWSON ASSOCIATES
Engineering and Environmental Services

Storm Drain Alignments: Drainage Area J
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **24**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CSN	18639,616.02	BPF	3/92	

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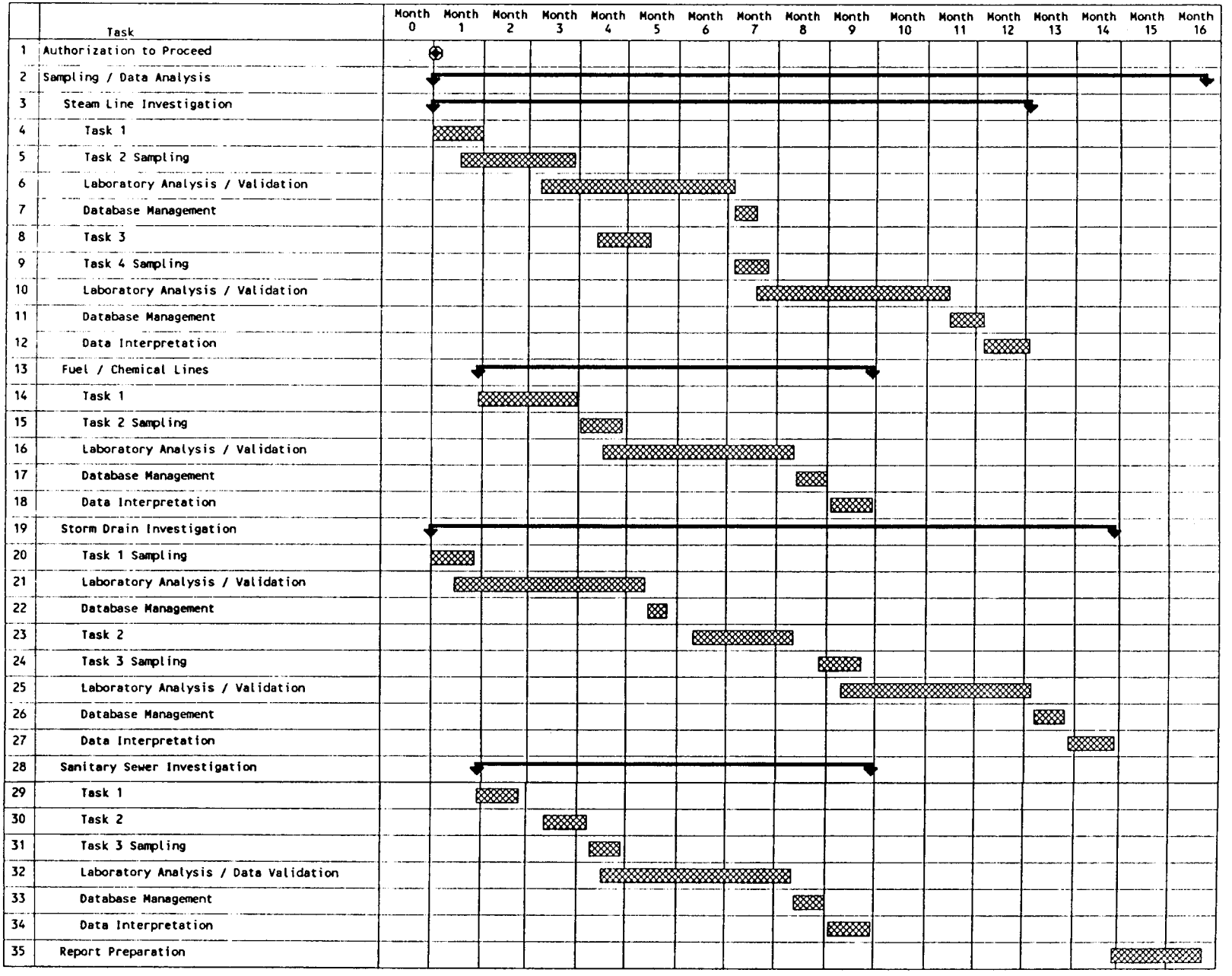
19920320.1410

Navy CLEAN Contract N62474-88-D-5086
SI Work Plan - Utilities



Underground Utilities Site Inspection Schedule
Site Inspection Work Plan: Underground Utilities
Hunters Point Annex
San Francisco, California

PLATE **25**

Harding Lawson Associates
Engineering and
Environmental Services

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AG	18639,616.03	BOF	11/91	

Appendix

NAVY RESPONSES TO COMMENTS ON DRAFT SI WORK PLAN:

VOLUME I OF III

The following are the Navy's responses to comments by the U. S. Environmental Protection Agency (EPA), Region IX, on the Site Inspection Work Plan: PA Other Areas/Utilities, Volume I of III Underground Utilities, Naval Station, Treasure Island, Hunters Point Annex. The EPA presented their comments in a letter dated February 12, 1992.

COMMENT NO. 1

Page 6, Section 1.2, Paragraph 1. The statement that the "two aquifer zones are separated by the bay mud deposits over the majority of the site" does not adequately describe the potential for the two aquifers to be in direct contact. Information from OU I (Primary Phase IIA Data Submittals for OU I Sites, draft, November 1991) has indicated that the bay mud is absent in some areas, in particular, in the vicinity of PA-47. As direct connection between two aquifers is a primary pathway for migration of contaminants, this information should be clearly stated.

RESPONSE TO COMMENT NO. 1

The text of the draft final work plan has been modified to indicate that the possibility exists for direct hydraulic connection between the two aquifers.

STEAMLINES (PA-45)

COMMENT NO. 2

Page 8, Section 2.3.1.1, Paragraph 1. The length of time for which the steamlines have been abandoned should be stated to provide background on the period in which contaminants might have been introduced into the lines and/or in which the integrity of the lines may have been breached thereby allowing infiltration or exfiltration of contaminants.

RESPONSE TO COMMENT NO. 2

On the basis of review of Navy records, Building 521 was operated as a steam generation plant from 1950 to 1969. Building 203, which was also used for steam generation, was still in operation as late as 1984 (*SFDA, 1986*). Therefore, the steamlines in some portions of the site may have been abandoned since 1969, while the steamlines in other parts of the sites may not have been abandoned until after 1984.

COMMENT NO. 3

Page 8, Section 2.3.1.1, Paragraph 1. A more thorough description of the physical characteristics of the steamlines should be provided in order to make the subsequent descriptions of locations of breaks, contaminants, sampling points, and inspection points more understandable. In particular:

COMMENT NO. 3(a)

What are dimensions of the "concrete-lined pipeline trenches"; are the trenches small areas closely confining the pipelines or are they large enough to allow a person to enter? Can liquids accumulate in the trenches?

RESPONSE TO COMMENT NO. 3(a)

The dimensions of the concrete-lined trenches at the site vary, but are generally approximately 3 feet wide and 2 feet deep. The trenches are not large enough for a person to crawl through. Liquids could accumulate in the trenches.

COMMENT NO. 3(b)

What is an "inspection hole (access hole)" (cited in paragraph 2)? Is it large enough for a person to enter the area containing the pipelines?

RESPONSE TO COMMENT NO. 3(b)

An inspection hole (access hole) is a point along the trenches that is covered with steel plates that can be removed to provide limited access to the piping within the trench. The length of the access holes varies from approximately 3 to 12 feet. In some areas the access holes open into deeper portions of the pipeline trenches that are large enough for a person to enter. To avoid confusion in the text, all references to access to the pipeline trenches have been changed to "access holes".

COMMENT NO. 3(c)

Is a "manhole" (first cited on Page 9, Paragraph 1) a portion of the steamline facility or does it serve other underground utilities as well? Is it the same as an "inspection hole (access hole)"?

RESPONSE TO COMMENT NO. 3(c)

The "manhole" referred to on page 9 is the same as the access holes described above. The reference to manhole has been changed to access hole in the draft final work plan.

COMMENT NO. 3(d)

What is a "utility vault" (first cited on Page 9, Paragraph 2)? Is it large enough for a person to enter? Is it the same as an "inspection hole (access hole)"? Can liquids accumulate in the utility vault? The term "access vaults" is used in the same paragraph: is it the same as the "utility vault"? The term "vaults", without adjective, is cited in Paragraphs 3 and 4 on Page 9 and in the bulleted paragraphs on Page 10.

RESPONSE TO COMMENT NO. 3(d)

A utility vault is the same as the pipeline trench. References to utility vaults in the text were changed to "pipeline trench" in the draft final work plan. As stated in the response to Comment 3(a), liquids could accumulate in the trenches.

COMMENT NO. 4

Page 8, Section 2.3.1.1, Paragraph 2. If Triple A used the steamline system to transport waste oils, then the lines must have a gradient to allow liquids to flow. (Steam which is transported under pressure would not be dependent on the gradient of the lines.) The gradient of the lines, if known, should be described in order to determine where liquids containing contaminants might flow.

RESPONSE TO COMMENT NO. 4

According to the DA report (*SFDA, 1987*) liquids were pumped from Drydock 4 to Tank S-505. Therefore, the gradient would not limit the areas to which oil might flow. The gradient of the lines may be important in locating areas where oil may have accumulated after pumping ceased, and if information on pipeline gradients can be obtained during Task 1, it will be evaluated prior to implementation of steamline sampling (Task 2).

COMMENT NO. 5

Page 8, Section 2.3.1.1, Paragraph 2. The first sentence states that "the steamline system was allegedly used by Triple A to transport waste oils...from Drydock 4, Building 521, and Berth 29." This implies that the waste oils were being transported to a destination. What was the destination, if any, or were the steamlines actually used as a dump point for waste oils with no subsequent destination intended? A better description of the disposition of possible waste oils entering the steamlines is needed.

RESPONSE TO COMMENT NO. 5

According to the DA Report (*SFDA, 1987*), oil was pumped from Drydock 4 through the steamline to the old power plant (Building 521) located across the street from the oil storage tank (Tank S-505). The report also indicates that at one point the steamline was diverted so that there would be a pipeline directly from Drydock 4 to Tank S-505. A description of the use of the steamlines to transport oil from Drydock 4 to Tank S-505 has been added to the draft final work plan.

COMMENT NO. 6

Page 8, Section 2.3.1.1, Paragraph 2. The inspection hole containing oil described in the last sentence of text cannot readily be identified on Plate 2. Is this the location of Sample SP-STM-1?

RESPONSE TO COMMENT NO. 6

The location of the access hole in which free product has been observed has been added to Plate 2. This was not the location of Sample SP-STM-1.

COMMENT NO. 7
Page 8, Section 2.3.1.1, Paragraph 3. It is not clear where the broken steamline was located; along Manseau Street fronting Building 502 or along H Street fronting Building 503. The location of the oil spill should be described more clearly or should be delineated on Plate 2.

RESPONSE TO COMMENT NO. 7

The approximate location of the broken steamline has been added to Plate 2.

COMMENT NO. 8

Page 8, Section 2.3.1.1, Paragraph 4. The nature and analytical results for sample SP-STM-1 should be described in greater detail. The text states that PCBs were not detected in the sample; however, as no detection limits are provided in the text or in Table 1, this statement is not supported. Also, the results are presented in units of mg/kg. Was this a sediment sample?

RESPONSE TO COMMENT NO. 8

The detection limit (1 mg/kg) was added to Table 1. The sample was an oil sample; oil sample results are usually reported on a weight-to-weight basis.

COMMENT NO. 9

Page 9, Section 2.3.1.1, Paragraph 1. The locations of areas of potential contamination in the steamlines reported in this paragraph are not readily identifiable on Plate 2. Which access hole at the intersection of Morrell and Manseau streets contained the dark oily substance? Is the pipe cut, described in the text as being at the west end of former Building 503, the same pipe cut labelled on Plate 2? In the Plate, the pipe cut is adjacent to Building 506. In addition, is the area described in Paragraph 3 on this page the same as described in Paragraph 1? In Paragraph 4, two "vaults" near the intersection of Morrell and Manseau streets are described. Is one of these the same as the "access hole" described in Paragraph 1?

RESPONSE TO COMMENT NO. 9

The locations of the access holes and cut pipe have been added to Plate 2. The text was also modified to clarify these locations.

COMMENT NO. 10

Page 10, Section 2.3.1.2, Bullet 1. Will the elevation or gradient of the pipelines be determined as a means of identifying the direction in which possible liquids bearing contaminants might flow?

RESPONSE TO COMMENT NO. 10

See response to Comment 4.

COMMENT NO. 11

Page 10, Section 2.3.1.2, Bullet 2. The task described in this bullet provides for sampling of waste oil. If liquids which do not appear to be waste oil are found in the steam lines, will such liquids be sampled also?

RESPONSE TO COMMENT NO. 11

A minimum of one fluid sample will be collected at each sampling location that contains fluid. If more than one type of fluid is encountered, one sample of each fluid will be collected.

COMMENT NO. 12

Page 10, Section 2.3.1.2, Bullets 2 and 4 and Table 3. To provide a clearer understanding of the scope of sampling, the number of samples to be collected should be cited in the text. This comment applies throughout the document.

(a) For Task 2, Plates 2 and 3 show 23 sampling locations. Table 3 provides for analysis of 25 samples. Is it the intention of the plan to collect, at a minimum, one sample at each of the 23 locations shown, plus one sample each at as many as two additional locations which may be identified during Task 1?

RESPONSE TO COMMENT NO. 12(a)

A minimum of one fluid sample will be collected at each access point where fluid is encountered; it is estimated that 23 samples will be collected, as shown in Table 3. If more than one type of fluid is encountered, one sample of each fluid will be collected.

(b) For Task 4, Table 3 provides for analysis of 10 to 20 soil samples. Is it the intention of the plan to collect a minimum of 10 to a maximum of 20 soils samples? What is the basis or rationale for the number of samples to be taken?

RESPONSE TO COMMENT NO. 12(b)

The number of trenches to be excavated will not be finalized until after Task 3 is completed. Therefore, the number of samples to be collected is presented as a range. A minimum of one sample will be collected from each trench. A sentence has been added to the draft final work plan stating that a minimum of one sample will be collected at each trench.

COMMENT NO. 13

Page 11, Section 2.3.1.3, Paragraph 1. The text does not refer to the soil samples to be collected in Task 4. To provide a clear understanding of the scope of the analytical program, the analytes for soil samples should be described. Table 3 indicates that soil samples will be analyzed for the same parameters as waste oil collected in Task 2.

RESPONSE TO COMMENT NO. 13

The text has been modified to include the soil samples collected during Task 4. Soil samples collected during Task 4 will be analyzed for the same constiuents as oil samples collected during Task 2.

COMMENT NO. 14

(a) This bullet states that samples will be analyzed for Priority Pollutant Metals (13 metals); however, the QAPjP (HLA, 1988b) calls for the analysis by CLP protocol which includes an analyte list of 23 metals. Which is correct? This comment applies throughout the document. The 13 Priority Pollutant Metals do not include barium and vanadium, both found in sample SP-STM-1.

RESPONSE TO COMMENT NO. 14(a)

Samples collected for metal analysis will be analyzed for the 13 Priority Pollutant Metals plus vanadium, barium, cobalt and molybdenum. The selected metals will be analyzed using CLP procedures. The text of the draft final work plan and associated tables have been modified to include the 4 additional metals listed above.

(b) The text does not include the information presented in Table 3 which states that molybdenum will be included in the metals analyses. What is the rationale for molybdenum?

RESPONSE TO COMMENT NO. 14(b)

Molybdenum is included in the metal analyses because it is a common fuel additive.

COMMENT NO. 15

Page 11, Section 2.3.1.3. To provide a complete characterization of possible contaminants in the steamlines, the list of analytes should include asbestos. As stated on Page 8, all of the steamlines were originally covered with asbestos-containing pipe lagging.

RESPONSE TO COMMENT NO. 15

Soil samples collected during trenching activities (Task 4) will be analyzed for asbestos.

COMMENT NO. 16

Page 11, Section 2.3.2.1, Paragraph 1. The reference to Berth 60 would be more understandable if a note was made on Plate 4 at the former location of this berth.

RESPONSE TO COMMENT NO. 16

A note indicating the former location of Berth 60 has been added to Plate 4.

COMMENT NO. 17

Page 11, Section 2.3.2.1, Paragraph 1. A more thorough description of the physical characteristics of the fuel Distribution Lines should be provided in order to make subsequent descriptions of specific details more understandable and to clarify the scope of the potential problem for this site. In particular:

(a) Are there four separate lines: new diesel oil, new lube oil, waste diesel oil, and waste lube oil? This would explain the reference on page 13, Section 2.3.2.2., Bullet 1 to "four suspected pipelines".

RESPONSE TO COMMENT NO. 17(a)

On the basis of review of Facility Control Diagrams, there are four suspected pipelines. This has been clarified in the draft final work plan.

(b) Assuming there are four lines, do the four lines (two new product lines and two waste material lines) parallel each other? Will all lines be found together at any given location along the pipeline?

RESPONSE TO COMMENT NO. 17(b)

On the basis of facility control diagrams, the fuel lines parallel each other. Lube oil lines do not run out to Piers 55 and 56, but appear to occur together elsewhere.

(c) State that the term "fuel distribution lines" used throughout this section means not only the new diesel lines, also the waste diesel and new and waste lubrication oil lines. Also, be consistent in use of either "diesel fuel" or "diesel oil". Both terms are used in this paragraph.

RESPONSE TO COMMENT NO. 17(c)

The term "fuel distribution lines" has been defined in the draft final work plan. The term "diesel fuel" will be used throughout the document.

(d) Were the fuel distribution lines gravity fed? Was waste material returned by pumping?

RESPONSE TO COMMENT NO. 17(d)

The small diameter (3 and 4 inches) of the fuel lines and the presence of pumping stations indicates that the lines were operated under pressure; pressure may have been provided by either pumps or static head associated with storage tanks.

(e) Page 12, Section 2.3.2.1, Paragraph 1. It is not clear from this description whether fuel distribution lines to Berths 55 and 56 have been abandoned. If they are still in use or if it is not known whether and when they were abandoned, it should be stated in this paragraph.

RESPONSE TO COMMENT NO. 17(e)

According to Navy records the fuel distribution lines to Berths 55 and 56 have not been abandoned. This statement has been added to the draft final work plan.

(f) Comparison of Plates 3 and 4 suggests that the fuel distribution lines run along the same pathway as the steamlines. Do the two sets of lines parallel each other?

RESPONSE TO COMMENT NO. 17(f)

On the basis of Navy facility maps, the lines do appear to parallel each other in some areas, especially along Buildings 128 and 130.

(g) Are the "access vaults" mentioned on Page 12 the same as the access vaults described for the steamlines? It is unclear whether the fuel distribution lines are visible within the access vaults or whether the vaults are only near the "approximate location of the fuel lines". See Comment 3(d) above concerning access vaults.

RESPONSE TO COMMENT NO. 17(g)

The access vaults mentioned on Page 12 are the same as the access vaults described for the steamlines. In some areas of the site the fuel distribution lines may be contained in the same pipeline trenches which contain the steamlines. It is not possible to verify this through visual inspection due to the large number of pipelines and the poor condition of the pipelines present within the trenches. The possibility that, in some areas, the fuel distribution lines may be contained in the pipeline trenches has been added to the draft final work plan.

(h) On Plate 4, is the line drawn between the sulfuric acid storage tank and the electrolyte storage tank (located between buildings 123 and 134) part of the fuel distribution lines? Is this area part of PA-46?

RESPONSE TO COMMENT NO. 17(h)

The line shown between the storage tank and the electrolyte storage tank is not part of the fuel distribution lines. The line was part of the piping associated with the Acid Mixing Plant (PA-24).

COMMENT NO. 18

Page 12, Section 2.3.2.1, Bullet 2. Plate 4 does not make a distinction between fuel distribution lines shown on facility maps (according to the previous paragraph, maps show lines to Berths 55 through 60) and "suspected fuel lines...to Berth 62".

RESPONSE TO COMMENT NO. 18

Plate 4 has been modified to indicate that the fuel distribution lines to Berth 62 are suspected fuel lines.

COMMENT NO. 19

Page 12, Section 2.3.2.1, bullets 4 and 5. It is not clear what "other utility lines" run parallel to the fuel distribution lines. As "the fuel distribution lines are not in concrete vaults", they should be easy to distinguish from the steamlines. The other utilities of concern should be described.

RESPONSE TO COMMENT NO. 19

On the basis of further review of facility utility maps, it is possible that the fuel distribution lines are contained in the concrete pipeline trenches in some parts of the site. The lines that may parallel the fuel distribution lines within the pipeline trenches include freshwater lines, saltwater lines, steamlines, and condensate lines. The text has been modified to include this information.

COMMENT NO. 20

Page 12, Section 2.3.2.1, Bullet 6
The location of the break should be shown on Plate 4. Also, what was done with the 55-gallon drum used to collect fluid from the leak. Is it still on site? Was the fluid analyzed?

RESPONSE TO COMMENT NO. NO. 20

The location of the break in the fuel distribution line has been added to Plate 4. Disposal of the contents of the 55-gallon drum was coordinated by the Treasure Island Staff Civil Engineers' Office.

COMMENT NO. 21

Page 13, Section 2.3.2.2, Bullet 1. Although it is technically feasible to use geophysical techniques to trace buried (presumably metal) pipe lines, will it be possible to distinguish the fuel distribution lines from other buried utilities which might be encased in metal pipe lines? Will the fuel distribution lines provide a different response from other buried lines? See Comment 19 above.

RESPONSE TO COMMENT NO. 21

We expect that the fuel distribution lines are metal lines and will be able to be traced using geophysical techniques in conjunction with utility maps of HPA. It may not be possible to differentiate pipelines contained in the pipeline trenches using geophysical techniques; however, the technique used in conjunction with utility maps to identify the diameters of the lines is expected to yield good results.

COMMENT NO. 22

Page 13, Section 2.3.2.2 and Table 3. The number of trenches and samples to be collected is not clear.

(a) Plate 4 shows 13 trench locations (or, possibly 14, see Comment 22(b)). Table 3 provides for analysis of 15 samples. Does this provide for, at a minimum, one sample at each trench location, plus one sample each at two additional locations which may be identified during Task 1?

RESPONSE TO COMMENT NO. 22(a)

A minimum of one sample will be collected from each trench. Table 3 has been modified to include one sample per trench location.

(b) Due to the complexity of the drawing in the area between buildings 123 and 134, it is not possible to discern whether the markings within the electrolyte storage tanks area represents a proposed trench location.

RESPONSE TO COMMENT NO. 22(b)

The markings within the electrolyte storage tanks area do not represent a proposed trench location.

COMMENT NO. 23

Page 13, Section 2.3.2.2. We recommend two additional locations for sampling based on the discussion provided in section 2.3.2.1: 1) the drummed liquid from the leak near building 134, and 2) if additional lines are found to contain fluids which appear to be fuel or lube oil, the fluid should be collected and analyzed. In particular, if waste diesel or waste lubrication oil remains in the lines, these materials could have hazardous waste characteristics (heavy metals) and could be a source of contamination if released.

RESPONSE TO COMMENT NO. 23

If liquids are encountered during investigation of the fuel distribution lines, samples of the liquids will be collected and analyzed for the same constiuents as the soil samples. The draft final work plan has been modified to include this contingency sampling. Sampling and disposal of the fuel from the spill, which was stored in a 55-gallon drum, is being coordinated through the Staff Civil Engineers' Office.

COMMENT NO. 24

Table 4. The activity for Task 2 appears to be wrong: "(If needed) Sediment Sampling". This should be replaced with "(If needed) Soil Sampling.

RESPONSE TO COMMENT NO. 24

Sediment Sampling in Table 4 has been replaced with Trenching in the draft final work plan.

COMMENT NO. 25

Page 14, Section 2.3.2.3. This list of analytes does not agree with the list provided in Table 3 which also includes hexavalent chromium and cyanide. This discrepancy should be corrected.

RESPONSE TO COMMENT NO. 25

Table 3 has been modified to match the analyte list provided on page 14.

FUEL DISTRIBUTION LINES: TANK S-505 (PA-47)

COMMENT NO. 26

Page 14, Section 2.3.3.1, Paragraphs 1 and 2. To provide a clearer understanding of the scope of the potential problem for this site, a better description of the lines and history of the site should be provided. According to the "Final Work Plan for Removal Action at Tank S-505" (HLA, 1990), "Tank S-505 was originally used to store diesel fuel for a nearby power plant (Building 521). Subsequently, it was allegedly used by Triple A...to store waste oil removed from ships undergoing repair". To clarify what kind of contaminants might be found in connection with these fuel distribution lines, the following information should be provided:

(a) Based on information provided in the Removal action Plan for Tank S-505 (HLA, 1990), it appears that these fuel lines were originally used to transport unused diesel fuel. It seems likely that the "Fuel Oil Receiving Station at Berth 29" was the location where new, unused fuel oil was delivered (presumably by tanker) to the Navy facility. The direction of transport of fuel in the distribution line would have been from the Fuel Oil Receiving Station to Tank S-505 (opposite to the direction of flow implied by Sentence 1 - "8-inch line from Tank S-505 to the Fuel Oil Receiving Station"). If this scenario can be confirmed, then the potential contamination resulting from Navy use of these fuel distribution lines would consist of leaks of unused diesel fuel.

However, if the same fuel lines were used by Triple to transport "waste oil removed from ships undergoing repair" then potential contamination from leaks along the fuel distribution lines could include PCBs or heavy metals contained in the waste oil.

RESPONSE TO COMMENT NO. 26(a)

The language in the draft final work plan has been changed to state that the lines run between Berth 29 and Tank S-505. The alleged use of Tank S-505 has also been added to the draft final work plan. It is not known whether Triple A used this line to transport waste oils, therefore the proposed analytical program includes analysis for PCBs, which may be present in waste oils.

(b) Information should be included as to what kind of material was transported by the "8-inch line from Tank S-505 to the Oil Reclamation Ponds. Was waste oil was transported to the Oil Reclamation Ponds by the Navy and/or Triple A? Knowledge of the kinds of waste oils transported by this line would indicate what kinds of contaminants might be expected if leaks are found in this line. Sampling of Tank S-505 contents detected the presence of PCBs; therefore, PCBs might be found in soils adjacent to the line to the Oil Reclamation Ponds.

RESPONSE TO COMMENT NO. 26(b)

According to the IAS *(Westec, 1984)* the oil ponds received oily waste from ships in dry dock or berths and from shipyard shop operations. The oily wastes were transported to the ponds either by tank truck or by an 8-inch pipeline from Berth 29. It is not known whether waste oil was also transported through the pipeline by Triple A. The text of the draft final work plan has been modified to include this information.

(c) Is there any information to indicate that any materials other than fuel oil were transported by each of the lines between Building 521 and the storage tank on the east side of this building --"6-inch line from the storage tank into Building 521, and a 2-1/2-inch line from Building 521 in the storage tank"?

RESPONSE TO COMMENT NO. 26(c)

There is no evidence that materials other than fuel oil were transported in the lines between Building 521 and the storage tanks on the west side of the building; however, because not all activities at the site are documented, it is possible that other material may have been transported in the lines.

(d) Clarify whether "access vaults" are part of the installation for the Fuel Distribution Lines or are utility vaults. See Comments 6(d) and 17(g) above concerning access vaults in general and their relationship to fuel lines in particular.

RESPONSE TO COMMENT NO. 26(d)

The access vaults referred to in this section are the same as the access holes referenced in the steamline section. See Comment 6(d) for a description of the access holes. The draft final work plan has been modified to use only the term access hole when appropriate.

(e) The location of the "cut, capped, and apparently abandoned" 8-inch line found between Tank S-505 and the Oil Reclamation Ponds should be shown on Plate 5.

RESPONSE TO COMMENT NO. 26(e)

The location of this line has been added to Plate 5.

COMMENT NO. 27

Page 15, Section 2.3.3.1, Paragraph 2. To make clear the nature of the potential problem, the second paragraph should state what kind of release may have occurred-fuel oil and/or waste oil.

RESPONSE TO COMMENT NO. 27

This section of the draft final work plan has been modified to state that both diesel fuel and waste oil could possibly have been released.

COMMENT NO. 28

Page 15, Section 2.3.3.2, Paragraph 1 and Bullet 1. The geophysical survey should also be used to identify the number and location of lines between Building 521 and Tank S-505.

RESPONSE TO COMMENT NO. 28

The geophysical survey will be used to identify the number of lines present between Building 521 and Tank S-505, if possible. If the lines are closely spaced, it may not be possible to identify individual lines.

COMMENT NO. 29

Page 16, Section 2.3.3.2 and Table 3. Plate 5 shows 6 trench locations and Table 3 provides for analysis of 6 samples. Does this provide for one sample at each trench location?

RESPONSE TO COMMENT NO. 29

A minimum of one sample will be collected from each trench location. The text has been modified to state this in the draft final work plan.

CHEMICAL DISTRIBUTION LINES: BUILDING 503 (PA-48)

COMMENT NO. 30

Page 17, Section 2.3.4.1, Paragraph 1. There appears to have been a misinterpretation of the nature of the underground utilities termed "Chemical Distribution Lines" near former building 503.

(a) Exhibit A, attached to this list of comments, includes the portion of a letter from EPA to E. Sarmiento, Naval Station, Treasure Island, dated January 14, 1991, referring to verbal information provided by a former HLA employee and to information in the "Preliminary Assessment Other Areas/Utilities" report (HLA, 1990) suggesting the presence of buried lines containing PCB-contaminated oils. The lines in question would appear to be former steamlines which Triple A allegedly used to transport PCB-containing oils.

RESPONSE TO COMMENT NO. 30(a)

The Navy agrees that the lines in question were probably former steamlines. The lines will be referred to as suspected steamlines in the draft final work plan.

(b) The PCB spill in the vicinity of 503, described on Page 8, Section 2.3.1.1, Paragraph 3 of this work plan, reportedly resulted from a broken steamline, in other words, these so-called Chemical Distribution Lines. Section 1.1.3.3. should be revised to correctly describe the source of information suggesting a problem ("Preliminary Assessment Other Areas/Utilities" report, HLA, 1990) and information provided by former HLA employee to EPA.

RESPONSE TO COMMENT NO. 30(b)

This reference has been added to the draft final work plan. As stated in the response to Comment 30(a), the lines will be referred to as suspected steamlines.

(c) These reported lines differ from other steamlines in that the former HLA employee suggested "a different route for the pipeline, but with similar end points" (Berth 15 and Building 521) to that of steamlines in the same area. Based on the description by the former HLA employee, the difference from steamline routing is that the reported pipeline makes a turn to the south from Manseau Street onto Hussey Street (rather than onto H Street), runs 350 feet along the west (not east as shown in Plate 6) side of Hussey to the vicinity of former Building 503, then turns west to H Street and rejoins the steamlines route running toward the Power Plant (Building 521).

RESPONSE TO COMMENT NO. 30(c)

The route suggested above is described in the draft report as the route for the chemical distribution lines. The text has been changed to indicate that this is a suspected route for the steamlines.

(d) The EPA report of information provided by the former HLA employee states that the line runs southwest along H Street toward the Power Plant, but examination of the map shows that H Street runs to the southeast. As compass directions seem to be inaccurate, both the west side of Hussey Street (as stated in the EPA report of HLA employee information) and the east side of Hussey Street and south side of Manseau Street (as shown in plate 6) should be investigated for the presence of buried lines.

RESPONSE TO COMMENT NO. 30(d)

Both the west and east sides of Hussey Street, and the south side of Manseau Street will be investigated for the presence of buried lines. This clarification has been added to the draft final work plan.

COMMENT NO. 31
Page 17, Section 2.3.4.2, Bullet 1. The geophysical survey should include mapping of both the east and west side of Hussey Street as described in Comment 30(d) above.

RESPONSE TO COMMENT NO. 31

The geophysical survey will include mapping both the east and west side of Hussey Street.

FUEL DISTRIBUTION LINES: BUILDING 205 (PA-49)

COMMENT NO. 32

Page 19, Section 2.3.5. Two contiguous, non-intersecting distribution lines are included under this PA. To make this fact clear the designation should read "Buildings 205 and 203 (PA-49)". This designation should be incorporated on pages 3 and 4 and in Table 3 and 7, also.

RESPONSE TO COMMENT NO. 32

The suggested change has been incorporated into the draft final work plan.

COMMENT NO. 33

Page 19, Section 2.3.5.1, Paragraph 1. To provide a clearer understanding of the scope of the potential problem for this site, a better description of the lines and history of the site should be provided. In particular:

(a) The nature of operations at Buildings 205 (Pump and Compressor Plant) and 203 (Power Plant-Substation H) should be explained. This would make the nature of the distribution lines clearer.

RESPONSE TO COMMENT NO. 33(a)

Building 203 was used as a boiler room for steam generation. Building 205 was used as a boiler room for steam generation and as a pumphouse for the drydocks. Both buildings are no longer in use. This information has been added to the draft final work plan.

(b) Only the pipelines associated with Building 205 were connected to "berths near Drydocks 2 and 3". A better description of this PA site would state that the pipelines associated with Building 205 served Drydocks 2 and 3 and Berths 1 and 2. Pipelines associated with Building 203 were connected to storage tanks next to the building which were, in turn, connected to a Fuel Oil Receiving Station at Berth 4.

RESPONSE TO COMMENT NO. 33(b)

The draft final work plan has been modified to include this information.

(c) There is no mention in the text nor depiction on Plate 7 of storage tanks for fuel which might have been distributed by the pipelines associated with Building 205. Is there documentation that fuel was transported by these lines? Have any storage tanks been identified in this area.

RESPONSE TO COMMENT NO. 33(c)

One tank (S-214) has been identified between Building 204 and Building 205. This tank was used to store fuel for the boiler units located in Building 205. The location of this tank has been added to Plate 7. According to HPA facility control drawings, the lines were used to transport diesel fuel.

(d) In the same manner as for PA-47 (see Comment 26(a) above), it is likely that the distribution lines associated with Building 203 were fuel oil distribution lines. The distribution lines connect Building 203 (Power Plant) to a "Fuel Oil Receiving Station" at Berth 4. As for PA-47. It is likely that this location where new, unused fuel oil was delivered (presumably by tanker) to the Navy facility. Did the 5500 bbl. fuel oil underground storage tank contain new fuel oil for use at Building 203? Was the direction of transport from the Fuel Oil Receiving station to the 5500 bbl. storage tank (opposite to the direction of flow implied by Sentence 1 "pipelines originating from Buildings 203 and 205")? What kind of fuel oil would have been used at the power plant?

RESPONSE TO COMMENT NO. 33(d)

The direction of transport of fuel is believed to be from Berth 4 to the tank adjacent to Building 203. Because operations at the facility are not well documented, it is unknown whether the lines were ever used to transport other materials. The proposed analytical program addresses this possibility. The text of the draft final work plan has been modified to indicate that the lines run between Berth 4 and Building 203.

(e) No mention is made in the text of the 14000 gal. brine underground storage tank connected by lines to Building 203. What was the source and nature of the brine? Would any hazardous materials be associated with this tank and the connecting lines?

RESPONSE TO COMMENT NO. 33(e)

The source and nature of the brine are unknown. According to the Removal Action Plan/Closure Plan, records and field observations did not indicate that the tank was used to store hazardous material *(PRC, 1991)*.

COMMENT NO. 34

Page 19, Section 2.3.5.2, Bullet 1. See Comment 21 above concerning using geophysical techniques to distinguish between buried utilities. The fuel distribution lines appear to follow the same pathway as the steamlines (PA-45). Also, will the lines between Building 203 and the storage tanks be traced?

RESPONSE TO COMMENT NO. 34

According to the facility control drawings, the fuel lines do parallel the steamlines in this area. Where practical, geophysical techniques will be used in conjunction with facility drawings to help distinguish the lines. The lines between Building 203 and the storage tanks were removed during tank closure.

COMMENT NO. 35

Page 19, Section 2.3.5.2 and Table 3. Clarify scope of sampling. Plates 7 and 8 show 13 trench locations and Table 3 provides for analysis of 8 samples. This provides for less than one sample at each trench location.

RESPONSE TO COMMENT NO. 35

A minimum of one soil sample will be collected from each trench. Table 3 has been modified to reflect this.

COMMENT NO. 36

Page 21, Section 2.3.5.3. Samples collected in the vicinity of the "Brine line" near Building 203 might also be analyzed for anions such as chloride and sulfate. Analysis for cations such as calcium, sodium, and magnesium would be accommodated in the 23 metals included in the CLP inorganic target analyte list (see Comment 14(a) above concerning Priority Pollutant Metals).

RESPONSE TO COMMENT NO. 36

Major anions and cations are not known to be a concern at the site and are not recommended for analysis.

STORM DRAIN AND SANITARY SEWER (PA-50)

COMMENT NO. 37

Page 21, Section 2.3.6.1, Paragraph 1. A more detailed description of the sanitary sewer would provide a better basis for understanding the potential for release of contaminants which may have entered the system. In particular:

(a) Are reaches interconnected? Would contaminants discharged to a given reach be likely to enter other reaches?

RESPONSE TO COMMENT NO. 37(a)

Section 2.3.6.1 has been expanded to include a better description of the reaches that comprise the sanitary sewer system. It does not appear that the upper portions of individual reaches are interconnected based on review of the sanitary sewer maps.

(b) Where does the system discharge off site to the City and County of San Francisco's wastewater treatment system? Careful examination of Plate 9 does not reveal a discharge point. Plate 12 indicates the HPA sanitary system discharges to the city may be at the intersection of Crisp Avenue and Griffith Street to the west of HPA. If there is a single discharge point, then potential contaminants from all reaches are channeled to the final portion of Reach 10 which parallels the northern boundaries of IR-1/21 and IR-4. Larger, more visible directional arrows on the sanitary sewer map would improve the usefulness of Plate 9.

RESPONSE TO COMMENT NO. 37(b)

The location of the connection between the HPA sanitary sewer system and the San Francisco city system (the manhole at Griffith Street) has been added to Plate 9. The arrows indicating the direction of flow within the system were enlarged.

(c) There are a number of buildings shown on Plates 10, 11, 12 and 13 which do not appear to be connected to the sanitary sewer system, e.g., Buildings 307, 374, 375, 380 all on or near the regunning pier shown on Plate 11. Do these buildings have plumbing? Would there be discharges from these buildings?

RESPONSE TO COMMENT NO. 37(c)

Buildings with no apparent sanitary sewer hookups will be investigated as part of Task 1.

COMMENT NO. 38

Page 21, section 2.3.6.1, Paragraph 2. A more detailed description of the storm drain system would provide a better basis for understanding the potential for release of contaminants which may have entered the system. In particular:

(a) It is not clear how many discharge points into the Bay there may be for the storm drain system. Examination of Plate 14 suggests that there is more than one discharge point for some of the individual drainage areas.

RESPONSE TO COMMENT NO. 38(a)

The text of the draft final work plan has been modified to include a more complete description of the storm drain system including 17 minor drainage areas which drain nearshore and pier areas. These systems will be inspected and sampled as part of Task 1.

(b) Plate 14 shows storm drain lines which are not included within the boundaries of any of the ten drainage areas. For example, drain lines shown next to Berth 18, near Drainage Area J, are not included in a drainage area.

RESPONSE TO COMMENT NO. 38(b)

See response to Comment 38(a).

COMMENT NO. 39

Page 22, section 2.3.6.1, Paragraph 3. The purpose of "tidal flood gates" should be explained. What impact does a tidal flood gate have on storm water flow in the storm drains. Does the "closed position" completely block storm-water flow or does it impede inland tidal flow without completely blocking outward storm-water flow? Could storm-water flow be blocked and then reversed due to closure of flood gates such that contaminant-bearing storm water might flow upstream past its original entry point?

RESPONSE TO COMMENT NO. 39

The flood gates are designed to stop the inflow of corrosive bay water into the storm drain system. Closed tidal flood gates do not completely block storm drains. Water flows over the flood gates. On the basis of limited inspection, some flood gates appear to be frozen in the open position, while others are frozen in the closed position. The status of the flood gates will be investigated during inspections performed as part of Task 1.

COMMENT NO. 40

Page 22, section 2.3.6.2, Paragraph 1. If known, the nature of "known industrial wastes" discharged into the storm drain and sanitary sewer system should be described and the contaminants which might be expected should be listed in order to provide a better understanding of the potential problems at the site.

RESPONSE TO COMMENT NO. 40

The types and amounts of industrial wastes suspected to have been discharged to the sanitary sewer system are presented in Tables 11 through 17.

COMMENT NO. 41

Page 24, Section 2.3.6.3.1. Clarify scope of sampling. According to Plates 15 through 24 the number of samples to be collected in the Storm Drainage Area is: Area A - 10, Area B - 4, Area C-2, Area D-3, Area E-4, Area F-3, Area G-3, Area H-4, Area I-2, Area J-1 for a total of 36 compared to the 30-40 listed in Table 3 for Task 2(sic).

RESPONSE TO COMMENT NO. 41

A sentence has been added to the draft final work plan stating the number of samples to be collected from each drainage area. Table 3 has been modified to reflect the exact number of samples.

COMMENT NO. 42

Page 29, Section 3.1, Paragraph 1. This paragraph lists eight planned sampling activities but does not include sampling of liquids in steamlines described in Task 2 for PA-45 or possible liquids in fuel lines for PA-46 as suggested in Comment 23 above. Also, procedures for drum sampling should be described if drummed liquid is sampled as suggested in Comment 23 above.

RESPONSE TO COMMENT NO. 42

Sampling of waste oils inside the pipelines has been added to the list of planned sampling activities.

COMMENT NO. 43

Page 32, Section 3.6, Paragraph 1. This procedure for sampling sanitary sewer water does not agree with the procedure described in Section 8.3 of the QAPjP (HLA, 1988b). The QAPjP describes use of a Kemmerer-type sampler with a bottom-emptying mechanism to avoid aeration of the sample.

RESPONSE TO COMMENT NO. 43

Section 3.6 has been revised to be consistent with the procedure described in Section 8.3 of the QAPjP. A Kemmerer-type sampler will be used to collect sanitary sewer water samples.

COMMENT NO. 44

Page 33, Section 3.8, Paragraph 1. This section does not describe decontamination procedures for sampling equipment used for storm drain sediments, sanitary sewer water, or liquids in steamlines and/or fuel distribution lines. Due to the potential for presence of bacteriological contaminants, it may be appropriate to take special measures for handling and

decontamination of equipment used to collect water samples from the sanitary sewer and to collect soil adjacent to sanitary sewers.

RESPONSE TO COMMENT NO. 44

The decontamination procedures for sampling of storm drain sediments and waste oils from the steamlines are the same as those discussed in Section 3.8. The decontamination procedures for sampling of the sanitary sewers have been added to Section 3.8. Health and safety issues related to sampling of water from the sanitary sewer will be discussed in the Health and Safety Plan developed prior to the start of sampling. The decontamination procedures for equipment which is used for sampling the sanitary sewers have been added to Section 3.8.

COMMENT NO. 45

Page 33, Section 3.9, Paragraph 1. Neither the text or Table 23 includes sediments in the media for sample containers, handling, and preservation. Will sediments be collected in the 400 mason jars listed for soil in Table 23? The text does not list sanitary sewer water samples nor liquids from steamlines/fuel distribution lines.

RESPONSE TO COMMENT NO. 45

Table 23 has been modified to include sediment samples. Section 3.9 has been modified to include sanitary sewer water samples and liquids from the steamlines/fuel distribution lines.

COMMENT NO. 46

Page 33, Section 3.9, Paragraph 1. The number of QC samples is not fully explained in the text. There is no indication of the number of field duplicate samples which will be collected. Will duplicates be collected for water/oil samples as described in the QAPjP (HLA, 1988b) one for every lot of water samples or one per day?

RESPONSE TO COMMENT NO. 46

Duplicates of water and/or oil will be collected as described in the QAPjP (HLA, 1988b), one for every lot of water samples or one per day, whichever is greater.

COMMENT NO. 47

Page 37, References. U.S. EPA, 1991, should be more detailed in order to identify specifically the document dated January 14, 1991 to E. Sarmiento from C. Flippo. More than one letter relating to EPA comments on the Preliminary Assessment Other Areas/Utilities exists.

RESPONSE TO COMMENT NO. 47

This reference has been modified to include the above information in the draft final work plan.

COMMENT NO. 48

Table 23. This table has several inconsistencies.

(a) Oil is included as a sample matrix requiring hexavalent chromium and cyanide analysis although these analyses are not included for PA-45, Task 2, the only oil samples listed in Table 3.

RESPONSE TO COMMENT NO. 48(a)

Oil samples will not be analyzed for cyanide and hexavalent chromium. Table 3 has been modified to reflect this.

(b) Water/oil sample matrices are listed as receiving analyses for Priority Pollutant Metals including molybdenum, while soil sample matrix receives analyses for CLP metals. See Comment 14(a) above concerning Priority Pollutant Metals.

RESPONSE TO COMMENT NO. 48(b)

Table 23 has been modified and is now consistent between soil and water. Table 23 has been revised to include analysis of 13 Priority Pollutant Metals, and vanadium, barium, cobalt and molybdenum.

(c) Table 3 lists molybdenum as included in all metals analyses, soil, sediment, water and oil, but molybdenum is not included in Table 23 for soils metals analyses. (Sediments are not included as a matrix on this table.)

RESPONSE TO COMMENT NO. 48(c)

Molybdenum has been added to Table 23. Sediment has also been added to the table as a sample matrix.

The following are the Navy's responses to comments by the State of California, California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, on the Draft Site Inspection Work Plan: PA Other Areas/Utilities, Volume I of III: Underground Utilities, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California. The RWQCB presented their comments in a letter dated February 3, 1992.

GENERAL COMMENTS

GENERAL COMMENT a.

It is important that appropriate detection limits be utilized in the investigation of the storm drain system, including storm water discharges to, and sediment collected from, the storm drains. These detection limits are specified in the Quality Assurance Project Plan (QAPP) for the Environmental Sampling and Analysis Plan (ESAP) but not mentioned in the text of the above work plan.

RESPONSE TO GENERAL COMMENT a.

The detection limits specified in the Quality Assurance Project Plan (QAPP) for the Environmental Sampling and Analysis Plan (ESAP) will be utilized in the investigation of the storm drain system. The use of the detection limits specified in the analysis of storm drain sediment samples has been added to the text and Table 3 of the draft final work plan.

GENERAL COMMENT b.

Whenever water samples are collected (i.e., groundwater "grab samples" from boreholes, monitoring well water samples, storm water samples) field measurements of the following are to be taken: pH, conductivity, temperature and turbidity. The text of <u>all</u> work plans should reflect this approach. Water samples from the sewer system need not be subjected to field measurements.

RESPONSE TO GENERAL COMMENT b.

Section 3.5 of the draft final work plan has been modified to include field measurement of temperature, pH, conductivity and turbidity during groundwater sampling. Measurement of temperature, pH and conductivity are specified in the Section 8.1 of the QAPjP (*HLA, 1988b*). Measurement of turbidity is not specified in the QAPjP.

GENERAL COMMENT c.

The question of what constitutes "background" concentrations of contaminants (for the purposes of cleanup) has not yet been established. Whether or not detectable concentrations of contaminants may be higher than the "background", cleanup levels will be based on whether these concentrations pose a threat to human health and the environment.

RESPONSE TO GENERAL COMMENT c.

The Navy concurs that background levels have not been established.

SPECIFIC COMMENTS

SPECIFIC COMMENT a.

p. 8, Section 2.3.1.1, and Table 1: The text states that PCBs were not detected in sample SP-STM-1, but no detection limit was shown in the table. Please modify the table to show the detection limit for the sample as was done for the metals analyses.

RESPONSE TO SPECIFIC COMMENT a.

Table 1 has been modified to include the detection limit of PCBs in the draft final work plan. The detection limit is 1 mg/kg.

SPECIFIC COMMENT b.

p. 11, Section 2.3.1.3, and Table 3: The text implies that detection limits for the contaminants of concern (priority pollutant metals, VOCs, SOCs and PCBs/pesticides) will be equal to those of the CLP analyses for both soils on site and sediments in the storm drains. The inadequacies of these detection limits have been underscored on several occasions when the relationship to non-human receptors in San Francisco Bay, such as sediment communicating with the Bay via the storm drain system, is directly at issue. Adequate detection limits for sediment samples are specifically outlined in the ESAP. These detection limits should be used when analyzing storm water and sediments.

RESPONSE TO SPECIFIC COMMENT b.

The text in Section 2.3.6.4 which discusses the analytical program for the storm drain sediments has been modified, and states that the detection limits for storm drain sediment analyses will equal those referenced in the QAPP for the ESAP. Table 3 has been also modified to reference the QAPP for the ESAP.

SPECIFIC COMMENT c.

p. 13, Section 2.3.2.2, and Table 4: The text states that trenches will be dug and soil samples may be taken and analyzed, but the table states that "Sediment Sampling" will be performed. Please modify the table.

RESPONSE TO SPECIFIC COMMENT c.

Table 4 has been modified in the draft final work plan.

SPECIFIC COMMENT d.

p. 16, Section 2.3.3.3, and Tables 3 and 5: See above Specific Comment 1.b. with respect to the detection limits of sediments in the area of the oil reclamation ponds.

RESPONSE TO SPECIFIC COMMENT d.

At this time, it is not anticipated that sediment samples will be collected as part of the investigation of the oil distribution lines near the oil reclamation ponds. If samples of bay sediments are collected during investigation of the oil distribution lines, the detection limits presented in the QAPP for the ESAP will be used.

SPECIFIC COMMENT e.

p. 20, Section 2.3.5.3, and Table 3: Table 3 states that 8 soil samples will be taken for Building 205 and 8 trenching locations are shown on Plate 7. Plate 8 shows 5 proposed trench locations for the vicinity of Building 203, but the disposition of samples from those trenches are neither discussed in the text nor reflected in the number of samples to be analyzed in Table 3. Please show the samples to be taken from the vicinity of Building 203 on Table 3 and discuss them in the text where appropriate.

RESPONSE TO SPECIFIC COMMENT e.

A minimum of one sample will be collected from each trench. The text of the draft final work plan has been modified to include this clarification. Table 3 has been modified to include the number of samples to be taken in the vicinity of Building 203.

SPECIFIC COMMENT f.

p. 23, Section 2.3.6.2, and Tables 8, 9, and 10: Contaminants noted as not detected should report the detection limits (e.g., in parentheses). Where sample detection limits varied, the range of detection limits should be stated on the tables.

RESPONSE TO SPECIFIC COMMENT f.

Tables 8, 9 and 10 were modified to include the detection limits for those consituents which were not detected.

SPECIFIC COMMENT g.

p. 25, Section 2.3.6.3.1:

SPECIFIC COMMENT g.1.

Table 3, which reports the samplings for this investigation, is confusing. Should the headings under "Storm Drains" be Task 1 and Task 3?

RESPONSE TO SPECIFIC COMMENT g. 1.

The headings should read Task 1 and Task 3. Table 3 has been modified in the draft final work plan.

SPECIFIC COMMENT g.2.

The HPA QAPjP cited in the text does not present all of the up-to-date information necessary for the completion of this portion of the investigation. The detection limits specified in the QAPP for the ESAP (July 31, 1991) are the appropriate ones for chemical analysis of storm water discharges to, and sediment collected from, the storm drain system. Table 3 should reflect the differences in the detection limits required for this portion of the investigation.

RESPONSE TO SPECIFIC COMMENT g.2

Table 3 has been modified to include this information.

SPECIFIC COMMENT g.3

No mention is made in the text as to whether or not these water samples will be filtered. Please indicate whether the samples will be analyzed for total and/or dissolved contaminants.

RESPONSE TO SPECIFIC COMMENT g.3

Water samples collected from monitoring wells and from samples collected from the sanitary sewers will be analyzed for total dissolved metals. Water samples will be filtered in the field.

SPECIFIC COMMENT h.

p. 26, Section 2.3.6.3.2: See above, Specific Comment 1.g.2

RESPONSE TO SPECIFIC COMMENT h.

Section 2.3.6.3.2 discusses sampling of the sanitary sewer system. The sanitary sewer system discharges off site and not to the Bay; therefore, the lower detection limits which will be used for analysis of samples from the storm drains are not applicable to samples collected from the sanitary sewer.

SPECIFIC COMMENT i.

p. 27, Section 2.3.6.4: See above, General Comments a. and b. and Specific Comment 1.g.2.

RESPONSE TO SPECIFIC COMMENT i.

See responses to General Comments a and b, and Specific Comment 1.g.2.

SPECIFIC COMMENT j.

p. 29, Section 3.0: See above, Specific Comment 1.g.2.

RESPONSE TO SPECIFIC COMMENT j.

See response to Specific Comment 1.g.2.

SPECIFIC COMMENT k.

p. 30, Section 3.3., Paragraph 2: Modify to read: "...pH, conductivity, turbidity, and temperature..."

RESPONSE TO SPECIFIC COMMENT k.

Section 3.3 has been modified in the draft final work plan.

NAVY RESPONSES TO DTSC COMMENTS

The following are the Navy's responses to comments by the State of California, Environmental Protection Agency, Department of Toxic Substances Control (DTSC), on the Draft Site Inspection Work Plan: PA Other Areas/Utilities, Volume I of III: Underground Utilities, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California. The DTSC presented their comments in a letter dated February 11, 1992.

ENCLOSURE A

COMMENT NO. 1

Section 1.1.2; Is the presence of fuel and not chemical distribution lines at Building 205 verifiable by Navy records?

RESPONSE TO COMMENT NO. 1

On the basis of review of facility maps provided by the Staff Civil Engineers' Office at Treasure Island, only fuel lines are present at, and in the vicinity of, Building 205.

COMMENT NO. 2

Section 2.3.1.1; Reference is made to a spill "of an undetermined quantity of oil," which was cleaned up, however, no documentation and/or laboratory analytical results are available to confirm the adequacy of the cleanup. Some confirmation samples should be added in this area between Buildings 502 and 503.

RESPONSE TO COMMENT NO. 2

After completion of the first three tasks proposed for investigation of the steamlines, trenches will be excavated to evaluate the possibility of a release from the steamlines to the soil surrounding the steamlines. Because a release has been reported in the area between Buildings 502 and 503, trenches will be recommended in this area as part of Task 4.

COMMENT NO. 3

Section 2.3.2.2, Table 3; Please provide additional information on the depth and number of samples to be taken from the trench locations. Also, are the proposed samples from the trench locations. Also, are the proposed samples from the trenches listed on Table 3?

RESPONSE TO COMMENT NO. 3

A minimum of one sample will be collected from each trench. The depth at which the sample will be collected will vary depending on visual observations during excavation. The trenches will be excavated to the water table unless visual evidence of contamination is found above the water table. In the draft final work plan, the text and Table 3 have been modified to include this clarification.

COMMENT NO. 4

Section 2.3.6.3.1, Task 2; Provide more detail on the criteria for conducting a visual inspection versus hydraulic pressure testing, smoke testing or remote video scanning.

RESPONSE TO COMMENT NO. 4

Visual inspections will be conducted for all utilities. On the basis of the visual inspections, selection of hydraulic pressure testing, smoke testing, or remote video scanning will be made as a follow up to visual inspection in areas where the utilities appear to be in poor condition.

COMMENT NO. 5

Section 2.3.6.3.2; It is mentioned that after Tasks 1 and 2 are completed, 10 to 20 monitoring wells will be installed to characterize the sanitary sewer system conditions. Will the locations of these monitoring wells be included in a future report for regulatory approval?

RESPONSE TO COMMENT NO. 5

Proposed locations of monitoring wells which will be installed to characterize the sanitary sewer system conditions will be presented at an agency meeting. No interim reports are currently planned as part of the SI investigation.

COMMENT NO. 6

Section 3.2; Please provide greater detail regarding the placement of the trenched materials back into the trenches upon completion of visual inspection and classification of the subsurface materials. Is there a provision to properly dispose of obviously contaminated soil? How much flexibility is there for leaving the soil excavated until quick turnaround sampling results are received?

RESPONSE TO COMMENT NO. 6

If material which appears to be contaminated, based on visual or OVA screening, is encountered during trenching, excavation will stop. A sample will be collected and only material which does not appear to be contaminated will be placed back in the trench.

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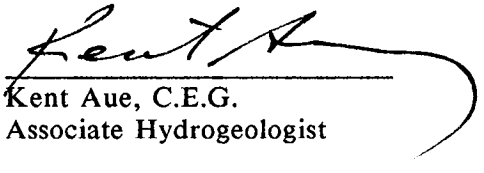

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DATED 2 APRIL 1992

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